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THE PERFORMANCE OF MALAYSIAN INITIAL PUBLIC OFFERINGS AND EARNINGS MANAGEMENT

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Abstract

An initial public offering (IPO) of equity provides a significant source of finance for Malaysian companies. Due to the existence of inequalities of wealth within Malaysian society as a result of its colonial heritage, the government has used IPOs to redistribute wealth among ethnic groups with the main objective being to increase the involvement of the Bumiputera (local indigenous people) in the corporate sector.

This thesis consists of three inter-related studies on Malaysian IPOs that were listed on the Bursa Malaysia (formerly known as the Kuala Lumpur Stock Exchange) during the period 1990 to 2000. In particular, this study investigates post-IPO performance using alternative performance approaches (market-based and accounting-based) and the earnings management explanation for observed performance.

The results from the first study indicate that Malaysian IPOs significantly *over*perform their benchmarks when performance is measured using both equally-weighted cumulative abnormal returns (*CAR*s) and buy-and-hold abnormal returns (*BHAR*s), except when matched companies are used as the benchmark. However, this significant *over*performance disappears when returns are calculated on a value-weighted basis and also when Fama-French (1993) three-factor regressions are employed. Cross-sectional analysis reveals differential performance related to year of listing, issue proceeds and initial returns.

The results from the second study using accounting-based measures provide strong evidence of declining operating performance in the IPO year and up to three years following an IPO. The year-to-year analysis reveals that the declining performance is greatest in the year immediately following the IPO. The deterioration in performance is

more pronounced when accrual-based operating performance measures are used. The difference in the results using accrual-based and cash flow-based approaches suggests the existence of earnings manipulation by the IPO manager. The investigation of the possible sources of operating performance changes suggests that post-IPO declines in asset turnover partially explain the poorer operating performance. Univariate analysis of the association between family relationships, retained ownership and post-IPO operating performance produces little evidence to explain the deterioration in operating performance. However, underpricing partially explains the deterioration when the cash flow-based performance measure is used.

The results from the third study reveal that Malaysian IPO companies employ income-increasing strategies around offerings, and that these strategies were more prevalent during the East Asian crisis period, especially for those companies that provided a profit guarantee. Analysis of the association between the magnitude of earnings management in the IPO year and post-IPO performance provides some evidence to support the view that aggressive earnings management at the time of an IPO subsequently leads to poor stock market and operating performance.

Overall, the evidence in this thesis supports the consensus that has emerged from the international debate on studies involving long horizon returns, which suggests that the magnitude of long run performance depends on the method employed to measure performance. The evidence derived from the accounting-based measure of operating performance supports the existing international evidence that operating performance declines following IPOs. The results also provide a degree of support for the earnings management explanation of post-IPO performance. These findings have implications for investors, security analysts, companies and accounting standard setters.

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Chapter 1

Introduction

1.1 Background and motivation to the present study

An initial public offering (IPO) or 'going public' is when a security, either debt or equity, is sold to the general public for the first time. The main objective is to raise capital for companies for the expansion of their business operations as an alternative to borrowing from banks.

In Malaysia, equity IPOs are important for several reasons. First, they have been used by the government as a part of its policy to redistribute wealth among ethnic groups, with the main objective of increasing Bumiputera[1] ownership in the corporate sector to 30% by the end of 1990 from a level of 2.4% in 1970 (Koon, 1997). Under the New Economic Policy (NEP, 1970-1990), which was replaced by the National Development Policy (NDP) in 1991, companies making IPOs are required to reserve 30% of the shares allocated to the public to be set aside for Bumiputera applicants. Second, IPOs have been used by Malaysian companies as a means of raising funds. Over the period from 1973 to 2004, a total of RM49.9 billion (about £6.8 billion)[2] was raised through IPOs (Bank Negara Malaysia, 2005). This accounted for 36% of all capital raised from the equity market, including ordinary shares (i.e. public issues, rights issues, special

[1] Bumiputera is an official definition widely used in Malaysia, embracing ethnic Malays as well as other indigenous ethnic groups.

[2] The exchange rate used is taken as at 31 December 2004. It is approximately £1 = RM7.32.

issues, private placements, restricted issues and offers for sale), preference shares and warrants; the percentage of total funds raised was approximately 11%. Another important motive for going public in Malaysia is ownership diversification. The importance of IPOs as a means of redistributing wealth, increasing Bumiputera ownership, raising funds, and ownership diversification attests to the practical relevance of research into Malaysian IPOs.

The Malaysian economy was growing prior to 1997 but suffered an economic crisis in 1997 and 1998, with most companies suffering a decline in profitability. Overall, the total earnings after tax of listed non-financial companies declined by RM3 billion and RM14 billion in 1997 and 1998, respectively (Mohd Saleh and Ahmed, 2005). Given that accounting earnings convey information about company values to investors (DuCharme, Malatesta and Sefcik, 2004), it is expected that earnings management might have been more prevalent in such a period of high uncertainty. Managers might also have perceived a greater need to increase investors' confidence in their new share offerings due to the economic crisis.

In addition to the unfavourable economic conditions suffered by Malaysia, there is a *mandatory* requirement for Malaysian companies making an IPO to provide a profits forecast in the prospectus. One of the unique features of Malaysian IPOs is that since January 1996 certain Main Board[3] applicant companies and all Second Board companies have been required to provide a guarantee of meeting 90% of the profits

[3] Companies listed on the Second Board are typically (but not always) smaller than those listed on the Main Board of the KLSE. As of January 2001, companies seeking a listing on the Second Board must have a minimum issued and paid-up capital of RM40 million comprising ordinary shares of RM1.00 each. Meanwhile, those companies with paid-up capital of RM60 million or more are listed on the Main Board (Listing Requirements of the Kuala Lumpur Stock Exchange, Chapter 3: Section 3.04).

forecast in their prospectuses and 90% of the forecast profits for the two years following the IPO. These provisions might increase the likelihood that IPO companies manage their earnings following IPOs, particularly to achieve the guaranteed profits. Thus, the Malaysian environment during the period of the present study provides a unique opportunity to study IPO performance and earnings management in a developing country with unusual profits forecast regulations, under both favourable and unfavourable economic conditions. Therefore, addressing and understanding IPO performance and earnings management in a developing country such as Malaysia, with its unique circumstances, is of a great interest and importance.

Academically, there are several interesting issues relating to IPOs including, in particular, persistent anomalies in the pricing of equity IPOs, namely underpricing and long run underperformance.[4] Underpricing, or positive initial returns to IPO investors, refers to the situation where the offer price of shares to investors of IPO companies is considerably lower than the price at which they are subsequently traded on the stock market. As summarised in Ritter (2003), there is pervasive evidence of underpricing in virtually all markets, including Malaysia. Ritter (2003) reports that the average underpricing for US IPOs over the period 1960 to 2001 is 19%, and he suggests that US IPO companies leave a considerable amount of 'money on the table'.[5] He states that the degree of underpricing is even greater in Malaysia, with an average value of 104%

[4] There is another pattern associated with an IPO, namely 'hot issue' markets. This refers to the time-series behaviour of first day returns and the number of companies coming to market, in which high initial returns tend to be followed by rising IPO volumes (Ritter, 1984). Ibbotson and Ritter (1995), Ritter (1998), and Ritter and Welch (2002) have reviewed the literature concerning all three patterns.

[5] The dollar amount of underpricing per share, multiplied by the number of shares offered, is referred to as the amount of 'money left on the table' (Ritter, 1998).

during the period 1980 to 1998. Underpricing is regarded as costly to IPO companies in general, and to existing shareholders in particular. This is because both the absolute holdings and the percentage holdings of the existing shareholders in the company are reduced after the IPO but the shares are sold at an offer price which is lower relative to the market's valuation on the first day of trading. However, from the new investors' point of view, positive initial returns will benefit them as they gain higher returns for purchasing shares at a lower offer price.

The second anomaly is IPO long run underperformance, whereby the long run returns of the IPO companies are lower than an appropriate benchmark. In this scenario, investors appear to lose out by continuing to hold the shares of IPO companies. The findings of significant long run under/*over*performance can be regarded as evidence inconsistent with market efficiency and '*imply a profitable trading rule (ignoring trading costs)*' (Kothari and Warner, 2004).

While the majority of studies in the UK and the US find that IPO companies in general are found to underperform their benchmarks in the three to five years post-IPO period, the international empirical evidence on long run stock market performance is less clear. Different findings are observed when different methods are used to measure long run stock market performance. There is a debate in the IPO literature (e.g., Loughran and Ritter, 1995; Barber and Lyon, 1997; Kothari and Warner, 1997; Fama, 1998; Lyon, Barber and Tsai, 1999; Gompers and Lerner, 2003) on the measurement problems involved in estimating long run stock market performance, such as which benchmark to use to estimate abnormal returns, how to calculate long run returns and how to construct test statistics. This is due to the fact that the benchmark used may not adequately adjust for risk and the methods used are subject to various statistical biases (Fama, 1998). The

underperformance phenomenon might merely be a function of poor research design or measurement. These measurement problems may provide a possible explanation for the conflicting evidence found in different countries.

In prior research on long run stock market performance Malaysian IPO companies are found to *over*perform their market benchmarks over a three year period (e.g., Wu, 1993; Mohamad, Nassir and Ariff, 1994; Paudyal, Saadouni and Briston, 1998; Jelic, Saadouni and Briston, 2001; Corhay, Teo and Rad, 2002; Sun and Tong, 2002). The method used to calculate long run stock market performance by these studies is based on the event-time approach, using metrics such as the cumulative abnormal return (*CAR*) and the buy-and-hold abnormal return (*BHAR*). The event-time approach is adopted when performance is measured relative to the date of the IPO. For the *CAR* metric, the abnormal return for each period is cumulatively summed over the holding period, with rebalancing. On the other hand, when the *BHAR* metric is used, the return is compounded over the holding period without rebalancing. Fama (1998) and Mitchell and Stafford (2000) argue that both metrics suffer from the cross-sectional dependence of observations in addition to rebalancing bias and skewness bias inherent in the *CAR* and *BHAR* metrics, respectively. They suggest the alternative calendar-time[6] approach to control for event clustering and cross-correlation in IPO returns. This approach is adopted by obtaining the returns for each sample company which had an IPO event in the last post-event period of interest (e.g., three or five years). The portfolios of these companies are re-formed every month and the portfolio return in that month is then

[6] The calendar-time approach was developed by Jaffe (1974) and Mandelker (1974).

calculated. The abnormal returns are then estimated using a return-generating model such as the Fama and French (1993) three-factor.

The existing Malaysian evidence on IPO long run stock market performance has some limitations. Some studies have used relatively small samples (e.g., Wu, 1993; Mohamad *et al.*, 1994), others have examined only those companies listed on the Main Board of the KLSE (e.g., Wu, 1993; Mohamad *et al.*, 1994; Paudyal *et al.*, 1998; Jelic *et al.*, 2001), while all the studies have examined periods up to the year 1997. Several studies are restricted in scope; e.g., by focusing on the effect of underwriter reputation (Paudyal *et al.*, 1998; Jelic *et al.*, 2001), privatisation (Paudyal *et al.,* 1998; Sun and Tong, 2002), management earnings forecasts (Jelic *et al.*, 2001) or the effect of growth-value stocks (Corhay *et al.,* 2002). In addition, all the studies on the Malaysian market employ the event-time approach and none have fully addressed the measurement problems which have been subject to intense debate in studies involving long-horizon returns.

In line with the focus of recent studies on long horizon returns, the first empirical component of this thesis takes steps to address the measurement problems and re-examines the robustness of existing Malaysian evidence by using several methods to measure returns, using different market benchmarks to adjust the returns, and by using more robust statistical tests. The variety of methods will enable a view to be formed as to whether the findings of this study are sensitive to the methods employed. This study therefore adds to the growing body of international evidence on the long run performance of IPOs. It is also of interest to examine long run returns as they may capture the impact of share trading by investors who did not have an opportunity to buy shares at the initial offering price.

Operating performance is an alternative performance approach that provides a potential explanation of the somewhat anomalous short run and long run stock market performance of IPOs. In general, existing international studies find that operating performance declines in the post-IPO period (e.g., Jain and Kini, 1994; Cai and Wei, 1997; Balatbat, Taylor and Walter, 2004). However, the majority of prior studies are based on the accrual measure of accounting profits. Although this approach draws attention to the existence of poor operating performance following IPOs, by its nature it fails to capture the impact of earnings management at the time of IPOs. This is due to the fact that accrual-based profit measures are potentially subject to accounting manipulation by managers, for example through working capital adjustments (Teoh, Welch and Wong, 1998a). Furthermore, the operating cash flow measure adopted by several studies (e.g., Jain and Kini, 1994; Kim, Kitsabunnarat and Nofsinger, 2004) has not always been 'properly' calculated, thereby resulting in a poor proxy (Bowen, Burgstahler and Daley, 1986).

Only one study has been carried out on the Malaysian market to examine operating performance (Sun and Tong, 2002). This employs the accrual-based profit approach on a sample of just 24 privatisation IPOs (PIPOs), and finds that the operating performance of Malaysian PIPOs insignificantly improves in the post-PIPO period. This small sample is unlikely to be representative of the overall IPO population which consists mainly of private companies rather than previously state-owned companies. There also appears to be a distinct lack of investigation into the use of both accrual- and cash flow-based measures of operating performance: using both accrual- and cash flow-based proxies to examine IPO companies' operating performance should improve reliability. Thus, the second empirical component of this thesis explores post-IPO operating performance using both accrual- and cash flow-based approaches for a large sample of

both private and privatisation IPOs. Comparison between these results will also allow some broad inferences to be reached about the likelihood of pre-IPO earnings management in Malaysian IPOs.

The earnings management hypothesis suggests a potential explanation for poor post-IPO performance. According to this hypothesis, investors may overvalue new issues because of misinterpreted high earnings reported at the time of offerings, and fail to realise that the earnings management symbolises a transitory increase in earnings (Teoh *et al.,* 1998a). Therefore, investors are likely to be disappointed by the declining post-IPO operating performance and adjust their valuation downwards, which in turn causes the poor stock market performance. Existing literature in the US and the Netherlands (e.g., Teoh *et al.*, 1998a; Roosenboom, van der Goot and Mertens, 2003) provides evidence in support of this hypothesis.

In Malaysia, a working paper by Abdul Rahman and Wan Abdullah (2003) is the only study to investigate earnings management by companies involved in IPOs. It finds evidence to support the existence of earnings management prior to the IPO, but no significant relationship between earnings management and post-IPO long run stock market performance. However, it examines only earnings management prior to the IPO and its relationship with post-IPO share returns for a sample period up to the year 1998. The time-series and cross-sectional patterns of post-IPO earnings management are not analysed. In addition, the relationship between IPO year earnings management and post-IPO operating performance is not investigated.

The third empirical component of this thesis addresses this earnings management issue by assessing the earnings management from the IPO year up to three years post-IPO,

and its association with both stock market and operating performance. As Malaysia suffered an economic crisis in 1997/1998, earnings management may have been higher in this period due to the need to increase investors' confidence in new issues. In addition, the mandatory earnings forecasts and unique profit guarantee feature of Malaysia IPOs may have increased the likelihood that earnings are managed following IPOs. Therefore, the present study also explores whether earnings management is higher during unfavourable economic conditions and whether companies continue to manage earnings following IPOs.

In summary, companies that are in the process of going public provide unique opportunities to investigate some important issues in accounting and finance. Based on the issues highlighted in this chapter, this thesis evaluates the performance of Malaysian IPOs and earnings management for equity issues during the period 1989 to 2003.

1.2 Research questions, approaches taken and thesis organisation

This thesis consists of three inter-related studies on Malaysian companies involved in IPOs. It investigates alternative performance approaches (market-based and accounting-based) and the earnings management explanation for post-IPO performance. Using share price data (market-based) to examine the long run performance of IPOs provides a direct measure of performance in terms of returns to shareholders. However, the accounting measure of performance can be used as a gauge of the efficiency of managers in managing their companies. Due to the fact that stock prices may not reflect all available information, accounting profitability is a useful additional measure of performance (Wang, 2005).

This thesis is organised into 13 chapters, including this introduction. Chapter 2 briefly outlines the Malaysian environment in order to provide a background to its IPO market. It starts with an overview of the Malaysian capital market, economy and culture. It further describes the regulatory structure and the reporting framework for Malaysian companies as well as the IPO listing process. Chapter 3 reviews the theoretical explanations for both underpricing and long run underperformance.

This is followed by the first empirical study on market-based performance, which spans Chapters 4, 5 and 6. Chapter 4 reviews prior empirical studies and identifies the research hypotheses relating to stock market performance. Two broad research questions are addressed: *'How do Malaysian IPO companies perform relative to several benchmarks in the long run?'* and *'do both event-time and calendar-time approaches produce the same results?'* Using both approaches can mitigate various statistical biases involved in the event-time approach employed in previous Malaysian studies of this nature. The research design used to investigate the stock market performance is described in Chapter 5. The study uses a sample of 454 IPO companies that were listed on the Bursa Malaysia (formerly known as the Kuala Lumpur Stock Exchange or KLSE)[7] during the period 1990 to 2000. The three-year post-listing performance of these companies is examined using both the event-time and calendar-time approaches. In the event-time approach, the *CAR*, *BHAR*, and wealth relative (*WR*) are calculated. The monthly stock returns for each IPO company are compared with the monthly stock returns of a matched company or market index benchmarks. In each case,

[7] Because the KLSE was renamed Bursa Malaysia, effective from 1 May 2004, and this event occurred during the period when the study was undertaken, the KLSE or Bursa Malaysia will be used interchangeably throughout the thesis.

equally-weighted and value-weighted portfolios are constructed. In the calendar-time approach, the Fama-French (1993) three-factor model is applied. Chapter 6 then reports the empirical results for market-based performance, including the time-series and cross-sectional patterns of long run performance. To help explain post-IPO performance, the sample of IPO companies is broken down by year of listing, sector, board of listing, size, type of company (either private or privatisation IPO), gross proceeds, and initial returns.

The second empirical study relates to post-IPO accounting-based operating performance and is covered in three chapters (Chapters 7, 8 and 9). Chapter 7 reviews prior empirical studies and identifies the research hypotheses relating to operating performance. The second study addresses the following research questions: *'Are accounting-based performance measures consistent with market-based performance measures?'* and *'do the accrual- and cash flow-based performance measures improve or deteriorate following IPOs in the long run?'* Chapter 8 outlines the research design used to investigate the operating performance, based on a sample of 254 Malaysian IPO companies over the period 1990-2000 using both accrual- and cash flow-based measures of operating performance. The present study uses 'good' cash flow-based performance measures with additional adjustments suggested by Bowen *et al.* (1986). To provide a control for changes in regulations, or economy or industry-wide factors, the operating performance of IPO companies is compared to a matching company of a similar industry, pre-operating performance and size. Chapter 9 reports the empirical results of accounting-based operating performance. The potential sources of operating performance changes, market expectation measures, and leverage are also reported. The pattern of performance is also analysed by categorising the sample into family or

non-family relationship groups, high or low retained ownership groups, and high or low underpricing groups.

The third empirical study explores the linkage between earnings management and post-IPO performance, and is provided in Chapters 10, 11 and 12. Chapter 10 reviews prior empirical studies and research hypotheses on earnings management and IPO performance. This study addresses the research question: *'Do Malaysian IPO companies manage earnings at the time of IPOs?'* If so, *'does more aggressive IPO year earnings management lead to worse subsequent stock market and operating performance?'* The aim is to investigate whether the existence of earnings management at the time of IPOs may provide an explanation for the stock market and operating performance observed in the post-IPO period. Chapter 11 then describes the research design used to investigate earnings management and its association with post-IPO performance, using the same sample of 254 IPOs as in the second study. Discretionary current accruals (DCA)[8] are estimated using the cross-sectional modified Jones model to proxy for earnings management. Chapter 12 provides the results concerning earnings management and IPO performance and describes the earnings management pattern over time. The level of earnings management is categorised by year of IPO and also by whether companies provide profit guarantee or non-profit guarantee disclosures. An analysis of the distribution of the stock market and operating performance changes by the IPO year DCA quartiles is also provided.

[8] Following the earnings management literature, the terms 'discretionary accruals', 'unexpected accruals', 'managed accruals', and 'abnormal accruals' are used interchangeably throughout the thesis. Similarly, the terms 'nondiscretionary accruals', 'expected accruals', 'unmanaged accruals', and 'normal accruals' are also used interchangeably.

Chapter 13 summarises the main findings of the three empirical studies, discusses some important implications of the findings and concludes with suggestions for further research.

1.3 Contribution of the present study to the existing body of knowledge

This thesis represents the first comprehensive study of equity IPOs in Malaysia, investigating both stock market and operating performance, and the earnings management explanation for the observed performance. The research undertaken is important because it investigates an issue that has not been addressed sufficiently in Malaysia. Even though there has been tremendous growth in the IPO market in Malaysia, shown by increasing numbers of listed companies on the Bursa Malaysia, from just 285 companies at the beginning of 1990 to 963 companies at the end of 2004, research on 'going public' in Malaysia is relatively limited.

Compared to existing published Malaysian IPO studies, this research is the first large sample study that examines IPO performance (both market-based and accounting-based) and the issue of earnings management. Moreover, this study uses more comprehensive data by including the more recent sample of IPO companies listed on the Main Board and the Second Board of the Bursa Malaysia from 1990 to 2000. The sample is large and incorporates both private IPOs and privatisation IPOs, so is more likely to be representative of the population of IPOs in the Malaysian market. In this study, only IPOs up to December 2000 are included because the subsequent performance of IPOs over one- to three-year periods is investigated. Stock market performance is examined for three years while operating performance is examined for

five years (a year before the IPO, the IPO year and three years after). Therefore, the effective period of this study covers about 15 years (from 1989 through 2003/2004).

This thesis documents one aspect of the international evidence on long run performance and earnings management and it contributes to the literature on IPO performance and earnings management. Also, it investigates long run performance and earnings management issues in a developing market whereas most prior research focuses on developed markets. In addition, this study adds to the existing knowledge of the long run stock market performance of Malaysian IPOs by incorporating the calendar-time approach, using the Fama-French three-factor model. The use of this approach, which has not been adopted in prior Malaysian studies, may serve as a control for the cross-sectional dependence of observations that is inherent in the event-time approach employed in previous Malaysian studies. The results observed from the first empirical component of this thesis confirm existing knowledge that the long run stock market performance depends on the method employed.

The IPO performance that is examined not only focuses on shareholder wealth effects but also on accounting-based operating performance. Both accrual- and cash flow-based performance measures are adopted in examining accounting-based operating performance. The cash flow proxy incorporates additional adjustments suggested by Bowen *et al.* (1986), representing an improvement on proxies adopted in prior IPO studies. The second empirical component of this thesis adds to the existing knowledge that the operating performance of Malaysian IPOs declines in the post-IPO period, using either accrual- or cash flow-based performance measures. The study also finds that the accrual-based performance measure shows more deterioration than the cash flow-based

measure, suggesting that post-IPO performance is potentially related to the reversal of pre-IPO accruals.

The third empirical component of this thesis confirms existing knowledge on the existence of earnings management by Malaysian IPOs at the time of going public. It finds that earnings management activity is more prevalent during unfavourable economic conditions and among those companies that provide profit guarantee disclosures in IPO prospectuses.

By examining IPO performance and earnings management, this study shows how Malaysian investors react to publicly available information at the time of IPOs and in post-IPO periods. The results of this study will be of interest to accounting and finance professionals, such as security analysts, financial managers, accounting standard setters, and also to investors.

The following chapter provides the background to the Malaysian IPO market.

Chapter 2

The Malaysian environment: Background to the IPO market

2.1 Introduction

This chapter discusses the Malaysian environment with the intention of providing knowledge and understanding of Malaysian culture, its capital market and economy, the legal, regulatory and reporting framework for Malaysian companies,[9] and IPO activities. The first section describes Malaysian culture, its capital market and economy. This is followed by the second section, which provides an overview of the laws, regulations, rules, and standards that form the core corporate law[10] in Malaysia. The third section describes the Malaysian IPO market by explaining its listing process and features, while the final section summarises the present chapter.

[9] Public limited and private limited companies are the most common types of company in Malaysia. Private limited companies cannot sell shares to the public, and are distinguished by the label 'Sendirian Berhad', shortened to 'Sdn Bhd', or 'S/B' and must have a minimum of two members but are limited to 50 members. Public limited companies can sell shares to the public, and are distinguished by the label 'Berhad', shortened to 'Bhd' and must have a minimum of two members with no member limit (http://allmalaysia.info/msiacommerce/resources/business.asp, as at 25 October 2004).

[10] Core corporate law in Malaysia includes company law, securities laws, exchange listing requirements, accounting standards, and insolvency laws and regulations.

2.2 Malaysian culture, its capital market and economy[11]

2.2.1 Culture

Malaysia is classified by the World Bank as an upper-middle-income country, with a per capita gross national income of US$3,780 in 2003 (http://www.worldbank.org/my). Like the UK, Malaysia is a constitutional monarchy with an elected federal parliamentary government. The country has a multicultural society, consisting of Malay 50.3%, Chinese 23.8%, Indigenous 11.0%, Indian 7.1%, non-Malaysian citizens 6.6 % and others 1.2%, with a total population of 25.5 million in 2004. The ethnic mix in Malaysian society is due to the influence of the British, who brought immigrants from China and India to work in tin mines and rubber estates during the period of colonial rule from 1905 to 1957.

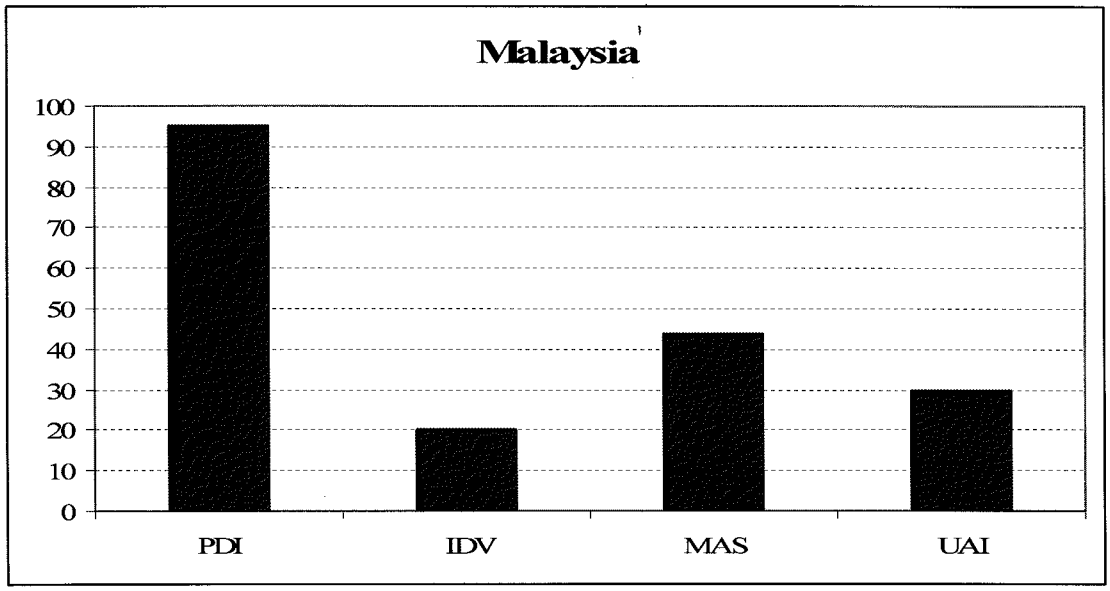
During the colonial period, the British introduced a 'divide and rule' system which prevented the races from uniting. The Chinese lived mainly in towns and strongly controlled business and trade; the Indians worked as rubber tappers and lived on the estates, while the Malays lived mostly in rural areas, were involved in fishing and farming, and suffered economic hardships. Therefore, inequalities of wealth emerged within the society due to its colonial heritage.

Hofstede (2001) develops a model that identifies four primary dimensions to assist in differentiating cultures, namely: (i) Power Distance (PDI); (ii) Individualism (IDV); (iii)

[11] This description is based on the KLSE publication, 'Investing in the Stock Market in Malaysia' (1998), the KLSE, the SC (Securities Commission), the MIDA (Malaysian Industrial Development Authority), the Department of Statistics Malaysia, the Economic Planning Unit, and the World Bank websites; and the Bank Negara Malaysia annual reports (various years).

Masculinity (MAS); and (iv) Uncertainty Avoidance (UAI). These Hofstede dimensions correlate with country, cultural and religious factors. The inequality of wealth within Malaysian society is consistent with the Power Distance dimension of Hofstede (2001). As can be seen from Figure 2.1, Malaysia has a high Power Distance Index (PDI), ranked at 95 compared to the average PDI for Asian countries of 71 and a world average of 55. As interpreted by Hofstede, the high PDI indicates that there are inequalities of power and wealth within Malaysian society. The next highest Hofstede dimension is Masculinity (MAS) with a score of 44, which is slightly lower than the world average of 50. The low masculinity score indicates that Malaysia has a low level of differentiation and discrimination between genders. In Malaysia, females are treated equally to males in all aspects of society.

Figure 2.1 Geert Hofstede's cultural dimensions



Source: http://www.geert-hofstede.com/hofstede_malaysia.shtml.

The next lowest score in the Hofstede dimensions for Malaysia is Uncertainty Avoidance (UAI), with a score of 30 compared to the Asian average of 58 and a world

average of 64. A low Uncertainty Avoidance score indicates that Malaysia is less concerned about ambiguity and uncertainty and has more tolerance for a variety of opinions. As defined by Hofstede, Malaysian society is less rule-oriented since people are more ready to accept change and take more risks. The last Hofstede dimension for Malaysia is Individualism, with a low score of 20 compared to the world average of 40. Hofstede interprets Malaysian society to be more collectivist (rather than individualist) by nature. Unlike the UK and the US, which have highest Individualism scores of 89 and 91, respectively, the Malaysian culture reinforces extended families and collective responsibility among family groups.

2.2.2 The capital market and the economy

Over the last few decades, there has been a significant change in the capital market in Malaysia. The Malaysian capital market consists of primary[12] and secondary[13] equity markets, private and public debt securities markets, financial derivatives markets, and an Islamic-based financial instruments market. The capital market participants in Malaysia consist of local and foreign retail and institutional investors, local and foreign issuers, intermediaries (e.g., merchant banks, brokers, fund managers) and market institutions (e.g., issuing houses,[14] clearing[15] and depository institutions,[16] and the stock

[12] A primary securities market is a market in which new securities are sold. The function of the primary market is to raise new capital for companies.

[13] A secondary market is one in which outstanding issues of securities are traded. The function of the secondary market is to provide required liquidity for investors.

[14] There are two issuing house in Malaysia, namely MIDF Consultancy and Corporate Services Sdn Bhd and Malaysian Issuing House Sdn Bhd.

[15] Securities Clearing Automated Network Services Sdn Bhd (SCANS) is the Malaysian clearing house.

[16] Malaysian Central Depository Sdn Bhd (MCD) is the central depository institution in Malaysia.

exchange). The activities undertaken within the Malaysian capital market consist of securities broking and trading, investment management, financial risk management, and the provision of mergers and acquisition advice and underwriting.

The first formal organisation in the securities business in Malaysia was the Singapore Stockbrokers' Association, established in 1930. This organisation re-registered as the Malayan Stockbrokers' Association in 1937, but at this time there was still no public trading of shares. The public trading of shares began on 9 May 1960 when the Malayan Stock Exchange was formed, which was then renamed as the Stock Exchange of Malaysia in 1964. The common stock exchange continued to function, even after the withdrawal of Singapore from Malaysia in 1965, but was renamed as the Stock Exchange of Malaysia and Singapore (SEMS). In order to guide the development of the securities industry in Malaysia, a Capital Issues Committee (CIC) was formed in 1968. The SEMS was separated into the Kuala Lumpur Stock Exchange Bhd (KLSEB) and the Stock Exchange of Singapore (SES) in 1973, due to the termination of currency interchangeability between Malaysia and Singapore. In the same year, the Kuala Lumpur Stock Exchange was established and took over operations of the KLSEB as the main stock exchange. However, Malaysian companies continued to be listed on the SES and vice-versa until mutual delisting took place in 1990. All 53 Singapore companies were delisted from the KLSE's official list on 1 January 1990. The final separation resulted in the KLSE being a truly Malaysian stock exchange. It finally became a demutualised exchange and was renamed Bursa Malaysia in 2004.

The five major indices of the KLSE are the Composite, the EMAS (Exchange Main Board All-Share), the Second Board, and the Syariah and Technology Indices. The KLSE Composite Index was launched in 1986 as the main market indicator.

Since its independence from the British in 1957, Malaysia has been dependent on agriculture and commodities and is recognised as the world's largest producer of rubber and tin. At present, Malaysia is involved in manufacturing-based industries, particularly electronics, and has become an export-driven economy. In addition, Malaysian economic development plans envisage a knowledge-based economy in terms of research and technology development in the next ten years.

Due to the inequality of wealth within the society, the Malaysian Government introduced a New Economic Policy[17] (NEP, 1970-1990), which was replaced by a National Development Policy (NDP) in 1991, with the main intention of increasing Bumiputera involvement and ownership in the corporate sector from 2.4% in 1970 to 30% by the end of 1990 (Koon, 1997).[18] According to the Economic Planning Unit, a government body, more than two-thirds of corporate equity in Malaysia was owned by foreigners in 1970.

Table 2.1 shows the share ownership by group (Bumiputera, non-Bumiputera, Foreigners and Nominee companies) in 1990, 1995, 1999, 2000 and 2002, respectively.

[17] It was introduced following the race riots that took place in May 1969. Its twin goals are social restructuring across racial lines and poverty reduction, mainly within the Malay community (Koon, 1997).

[18] The restructuring target for other Malaysians and foreigners were 40% and 30%, respectively (http://www.epu.jpm.my, as at 24 May 2005).

Table 2.1 Ownership of share capital (at par value) of limited companies

	1990		1995		1999		2000		2002	
Ownership group	**RM million**	**% total**	**RM million**	**% total**	**RM million**	**% total**	**RM million**	**% total**	**RM million**	**% total**
Bumiputera	20,877.5	19.3	36,981.2	20.6	59,394.4	19.1	62,976.0	18.9	73,161.8	18.7
Bumiputera individuals and institutions	*15,322.0*	*14.2*	*33,353.2*	*18.6*	*54,046.0*	*17.4*	*57,173.6*	*17.2*	*66,746.0*	*17.1*
Trust agencies	*5,555.5*	*5.1*	*3,628.0*	*2.0*	*5,348.4*	*1.7*	*5,802.4*	*1.7*	*6,415.8*	*1.6*
Non-Bumiputera	50,754.0	46.8	78,026.9	43.4	125,013.3	40.3	137,412.8	41.3	168,962.7	43.2
Chinese	*49,296.5*	*45.5*	*73,552.7*	*40.9*	*117,372.4*	*37.9*	*129,318.3*	*38.9*	*159,806.9*	*40.9*
Indians	*1,068.0*	*1.0*	*2,723.1*	*1.5*	*4,752.9*	*1.5*	*5,136.8*	*1.5*	*5,951.1*	*1.5*
Others	*389.5*	*0.3*	*1,751.1*	*1.0*	*2,888.0*	*0.9*	*2,957.7*	*0.9*	*3,204.7*	*0.8*
Foreigners	27,525.5	25.4	49,792.7	27.7	101,279.2	32.7	103,909.4	31.3	112,727.6	28.9
Nominee companies	9,220.4	8.5	14,991.4	8.3	24,389.5	7.9	28,119.4	8.5	35,969.5	9.2
Total	108,377.4	100.0	179,792.2	100.0	310,076.4	100.0	332,417.6	100.0	390,821.6	100.0

Source: Economic Planning Unit at http://www.epu.jpm.my.

The data excludes government holdings except through Trust agencies (e.g., Permodalan Nasional Berhad and the State Economic Development Corporations). It shows that the objective of the NEP to raise Bumiputera ownership to 30% by the end of 1990 was not achieved. However, the growth in Bumiputera ownership since 1970 has been significant. As of 16 September 2004, the Prime Minister of Malaysia reported that Bumiputera equity ownership was RM73.2 billion, or 18.7% (Utusan online at http://www.utusan.com.my).

Apart from share ownership by ethnic groups, Leuz, Nanda and Wysocki (2003) report that there is a relatively high ownership concentration[19] in Malaysia (52%) compared to the UK (15%) and the US (12%). Similar to Malaysia, ownership concentration is also higher in Germany (Goergen, 1998). Leuz *et al.* (2003) find that earnings management is more pervasive in countries with a more concentrated ownership and report that Malaysia and Germany have relatively higher levels of earnings management, with an aggregate score[20] of 14.8 and 21.5, respectively, in comparison to the UK and the US with scores of 7.0 and 2.0, respectively.

The Malaysian economy experienced a growth rate of 8.7% per annum, from 1990 to 1996, which contracted to 7.4% in the years 1997-1998. This was because of the East Asian crisis that resulted from the collapse of the Thai baht in July 1997, subsequently

[19] This is measured by Leuz *et al.* (2003) as the median percentage of common shares owned by the largest three shareholders in the ten largest privately-owned non-financial companies.

[20] This is measured by Leuz *et al.* (2003) as the average rank across four earnings management measures, EM1-EM4. EM1 is the country's median ratio of company-level standard deviations of operating income and operating cash flow; EM2 is the country's Spearman correlation between the change in accruals and the change in cash flow from operations; EM3 is the country's median ratio of the absolute value of accruals and the absolute value of the cash flow from operations; and EM4 is the number of 'small profits' divided by the number of 'small losses'.

causing a currency crisis and stock market crash in Malaysia. This is reflected by funds raised through new equity issues, initially surging from RM9.9 billion in 1990 to 20.8 billion in 1996, and then dropping to RM1.7 billion in 1998, as shown in Table 2.2. Similar to the UK and the US, the degree of importance of equity markets[21] in Malaysia is high compared to other developing countries such as Indonesia and Thailand (Leuz *et al.*, 2003).

Table 2.2 Funds raised by Malaysian companies

Year	Public issues (RM million)	Rights issues (RM million)	Special issues/Private placement/ Restricted issues (RM million)	Offers for sale* (RM million)	Total (RM million)
1990	2,597.1	5,503.0	389.8	1,440.1	9,930.0
1991	230.3	1,672.6	793.6	1,367.2	4,063.7
1992	3,909.6	3,762.5	312.5	2,268.5	10,253.1
1993	171.0	2,429.1	782.0	1,149.4	4,531.5
1994	373.2	5,448.4	1,364.1	2,931.3	10,117.0
1995	1,155.6	5,594.1	2,436.0	4,456.7	13,642.4
1996	1,778.0	7,402.8	8,075.3	3,570.2	20,826.3
1997	2,928.7	9,362.4	4,037.8	2,787.6	19,116.5
1998	346.2	421.9	245.0	698.5	1,711.6
1999	634.3	6,107.6	872.6	364.8	7,979.3
2000	820.6	3,814.6	1,015.0	233.7	5,883.9
2001	951.7	1,184.5	431.7	1,728.2	4,296.1
2002	2,883.5	4,069.0	1,820.0	4,088.7	12,861.1
Up to 31.3.2003	77.2	232.9	26.9	308.2	645.2
Total	5,713.5	15,830.5	4,411.2	7,422.1	33,377.2

Note:

* include Restricted offer for sale.

Source: KLSE Statistics, March 2003.

The growth of the Malaysian capital market prior to 1997 is not merely due to rapid economic growth but also reflects the two broad policy objectives set by the

[21] This is measured by Leuz *et al.* (2003) as the mean rank across: (i) the ratio of aggregate stock market capitalisation held by minorities to gross national product; (ii) the number of listed domestic companies relative to the population; and (iii) the number of IPOs relative to the population. The scores for Malaysia, the UK, the US, Indonesia and Thailand are 25.3, 25.0, 23.3, 4.7 and 14.3, respectively.

government, namely the 'Privatisation Policy' and 'Vision 2020' (National Vision Policy-NVP). The Privatisation Policy was announced as a national policy by the Malaysian government in 1983. Based on this policy, privatised entities were required to allocate 30% of their equity to Bumiputera but limit foreign ownership to a maximum of 25% of their share capital (http://www.epu.jpm.my, as at 24 May 2005). As of 26 December 2000, a total of 40 privatised companies were listed on the KLSE, contributing 30.3% of the total market capitalisation (Economic Planning Unit, 2001). The Vision 2020 Policy, which embodied the NDP, was introduced by the Malaysian government in 1991, with a goal of attaining *'fully developed'*[22] country status by the year 2020 (Mahathir Mohamad, 2001).

Due to the economic crisis, on 1 September 1998 the government discontinued trading in its currency by pegging the ringgit to the US dollar (at RM3.80: US$1) and imposed controls on its capital market, particularly on investment from overseas.[23] With the help of these measures, the economy began to recover in 1999 with a growth rate of 5.6%, increasing to 8.3% by 2000. However, the global economic volatility and uncertainties caused by international terrorism, the wars in Afghanistan and Iraq, and the sudden appearance of Severe Acute Respiratory Syndrome (SARS) badly affected the Malaysian economy. It was also hit by the slump in the Information Technology (IT) sector in 2001. Even though the growth rate recorded in 2001 was 0.4%, the Malaysian economy improved in the subsequent four years (2001-2004) with growth rates of 4.2%,

[22] As defined by Mahathir Mohamad, the former Prime Minister of Malaysia, a *'fully developed'* country is one that is fully developed along a number of dimensions: economic, political, social, spiritual, psychological and cultural.

[23] In 1994, China also pegged its currency (the Chinese yuan) to the US dollar (McKinnon and Schnabl, 2004).

5.3%, and 7.1% in 2002, 2003, and 2004, respectively. The savings rate in Malaysia is high with the Gross National Savings (GNS) as a percentage of Gross National Product (GNP) being 24.6% and 36.3%, as recorded in 2002 and 2003, respectively (Bank Negara Malaysia Annual Report, 2004). Moreover, Malaysian economic growth was accompanied by a relatively low inflation rate of 1.5% and a low unemployment rate of 3.8% in 2004. The Malaysian key economic indicators are reported in Table 2.3.

According to the Malaysian Industrial Development Authority (MIDA), in 2004, Malaysia was one of the largest recipients of Foreign Direct Investment (FDI) among the developing countries. As argued by MIDA, this is due to its market-oriented economy, accompanied by an educated workforce and a well-developed infrastructure (http://www.mida.gov.my, as at 22 May 2005).

Table 2.3 Malaysian key economic indicators: 1989-2004

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
End of period exchange rate (equivalent to 1 unit of US$)	2.70	2.70	2.72	2.61	2.69	2.56	2.54	2.53	3.89	3.80	3.80	3.80	3.80	3.80	3.80	3.80
End of period KLSE Composite Index	562.0	506.0	556.2	644.0	1,275.3	971.2	995.2	1,238.0	594.4	586.1	812.3	679.6	696.1	646.3	793.9	907.4
Inflation rate (%)	2.8	3.1	4.4	4.7	3.6	3.7	3.4	3.5	2.7	5.3	2.8	1.6	1.4	1.8	1.2	1.5
Real GDP growth (%)	9.2	9.7	8.7	7.8	8.3	9.3	9.4	8.6	7.3	-7.4	5.6	8.3	0.4	4.2	5.3	7.1
Unemployment rate (%)	n.a*	n.a	n.a	3.7	3.0	2.9	2.8	2.6	2.6	3.2	3.4	3.1	3.6	3.5	3.6	3.8

Note:

* Not available.

Source: PACAP database, KLSE Publication 'Investing in the Stock Market in Malaysia', and Bank Negara Malaysia Statistics and Annual Reports (http://www.bnm.gov.my).

2.3 The legal, regulatory and reporting framework[24]

2.3.1 Law and legal system

The Malaysian legal system is based on English common law. Legal enforcement[25] in Malaysia is lower in comparison to the UK and the US, but is higher than in Indonesia and Thailand (Leuz *et al.,* 2003). However, the business environment in Malaysia is more highly regulated compared to the UK (Ow-Yong and Kooi Guan, 2000). Malaysian corporate law is principally set out in the Companies Act 1965, administered by the Registrar of Companies (ROC).[26] The Act provides a comprehensive legal framework for governing companies, which includes requirements for the birth, death and existence of companies. The Act also contains requirements with respect to disclosures on the contents of prospectuses.

2.3.2 Regulatory structure

Figure 2.2 shows the regulatory structure of the securities and futures industries in Malaysia. Security regulation, particularly on new equity issues, is administered by the Security Commission (SC) and the Bursa Malaysia Berhad.

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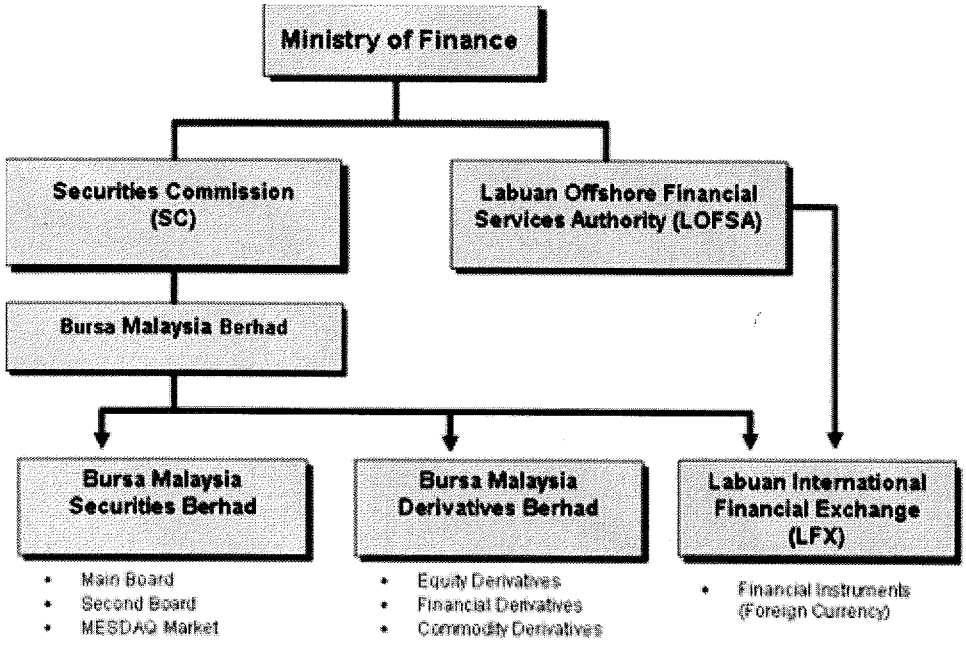
[24] This section is based on the SC Policies and Guidelines on Issue/Offer of Securities, KLSE Listing Requirements, website of Securities Commission, Paudyal *et al.* (1998), Jelic *et al.* (2001), Wan-Hussin (2001), Koh (2004) and Securities Commission Publication 'Capital Market Masterplan'.

[25] This is measured by Leuz *et al.* (2003) as the mean score across the index of: (i) the legal system's efficiency; (ii) the rule of law; and (iii) the corruption. The scores for Malaysia, the UK, the US, Indonesia and Thailand are 7.7, 9.2, 9.5, 2.9, and 4.9, respectively.

[26] The Companies Commission of Malaysia Act 2001 was set up and came into operation on 16 April 2002. The Act established the Companies Commission of Malaysia through a merger of ROC and the Registry of Business.

Figure 2.2 Regulatory structure diagrams



Source: http://www.bursamalaysia.com/website/aboutus/regstruct.htm (as at 23 October 2004).

2.3.2.1 Securities Commission (SC)

The Securities Commission (SC) was established in March 1993 as a statutory body under the Securities Commission Act 1993. The role of the SC is to provide regulations and to advise the Minister of Finance on all matters relating to the securities and futures industries. Among its responsibilities, the SC has to consider and make recommendations for the reform of the law relating to securities and futures contracts. The SC holds the central supervisory power as the market regulator of all fund-raising activities.

2.3.2.2 Bursa Malaysia Berhad (formerly known as the Kuala Lumpur Stock Exchange, KLSE)

The KLSE is the official stock exchange of Malaysia under the Securities Industry Act (SIA) which was passed in 1973.[27] The KLSE is a self-regulatory organisation with its own Memorandum and Articles of Association. It is the lead regulator for all exchange traded securities and derivatives. The role of KLSE is to govern the conduct of its members in securities dealings. It administers the Malaysian share market in which investors buy and sell shares and other securities (e.g., loan stocks, debenture stocks, bonds and warrants) issued by companies listed on the exchange. It is also responsible for the surveillance of the market place and for the enforcement of its Listing Requirements, which spell out the criteria for listing, disclosure requirements and standards to be maintained by listed companies.

A company making an IPO in Malaysia seeks a listing either on the Main Board (typically for larger capitalised companies), or the Second Board (typically for smaller sized companies). The Second Board was established on 11 November 1988 to enable smaller companies which are viable and have strong growth potential to be listed on the KLSE. Each board is further classified by sectors which reflect the core business of these companies. As of 31 December 2003, there were 13 industry classifications on the Main Board, namely: Technology, Consumer Products, Industrial Products, Construction, Trading/Services, Finance, Infrastructure Project Company (IPC), Hotel, Properties, Plantation, Mining, Trusts, and Closed-End Funds. However, there are only

[27] The SIA 1983 then replaced the 1973 Act in order to provide better supervision and control of the industry.

seven industry classifications on the Second Board, namely: Technology, Consumer Products, Industrial Products, Construction, Trading/Services, Properties, and Plantation. This is due to the fact that such companies under IPC or Financial Services are allowed to seek a listing only on the Main Board of the KLSE (Policies and Guidelines on Issue/Offer of Securities, Revised edition, 1 April 2003).

Companies wishing to transfer from the Second Board to the Main Board of the KLSE have to fulfil all the Main Board listing requirements and the companies had to have been listed on the Second Board for at least three years (prior to September 2001), now reduced to one year (Amendments to Policies and Guidelines on Issue/Offer of Securities, 3 September 2001).

The Malaysian Exchange of Securities Dealing and Automated Quotation Berhad (MESDAQ) was set up in May 1997 as the second stock exchange of Malaysia. MESDAQ was established to provide a capital market for the listing, buying and selling of securities of technology-intensive companies and high growth potential companies without a profit track record. However, MESDAQ merged with the KLSE on 18 March 2002 to form a single exchange as recommended by the Capital Market Masterplan. It was referred to as the MESDAQ Market instead of a third board in order to keep its identity of being a specialised market to cater for the capital raising needs of technology and high growth companies.

Table 2.4 summarises the minimum listing requirements of the Main Board, Second Board and the MESDAQ Market effective from May 2003.[28] Apart from the listing requirements, there is also a mandatory audit committee requirement for companies seeking a listing to the KLSE.

Table 2.5 shows the number of listed companies on the Main Board, Second Board and the MESDAQ Market as at 31 March 2003. As seen from Table 2.5, the number of companies listed grew from 413 in 1993 to 874. By 21 October 2004, when this section was written, there were 947 companies listed: 614 on the Main Board, 280 on the Second Board, and 53 on the MESDAQ Market, respectively.

[28] Wan-Hussin (2001) describes the evolution in the quantitative listing requirement for the Main Board and the Second Board for the period 1990 through August 2001.

Table 2.4 The minimum listing requirements on the Main Board, Second Board, and the MESDAQ Market

		Main Board	Second Board	MESDAQ Market
(i)	Operating history	5 years.	5 years.	For technology companies, none. For non-technology companies, a minimum period of generating operating revenue of at least 12 months at time of admission with the accounts for the said 12 months audited is required. For Technology Incubators, a minimum period of 12 months in operation at time of admission with the accounts for the said 12 months audited is required.
(ii)	Historical profit track record*	Uninterrupted profit record of three to five full financial years prior to submission to SC with an aggregate after-tax profit^ of not less than RM30 million over the said three to five full financial years, and an after-tax profit of not less than RM8 million in respect of the most recent financial year.	Uninterrupted profit record of three to five full financial years prior to submission to SC with an aggregate after-tax profit of not less than RM12 million over the said three to five full financial years, and an after-tax profit of not less than RM4 million in respect of the most recent financial year.	No profit record required for technology and non-technology companies and Technology Incubators.
(iii)	Issued and paid-up capital#	Minimum RM60 million.	Minimum RM40 million.	Minimum RM2 million for technology and non-technology companies. Minimum RM20 million for Technology Incubators.
(iv)	Par value	A minimum par value of not less than 10 sen per share.	Same as Main Board.	No requirements on par value. MESDAQ Market companies are given the flexibility to fix their par value that best fit the companies' capital structure and financial position.

Note:

* There is no minimum historical profit track record requirement for IPC companies.

^ After-tax profit refers to the profit after adjusting for profit or loss attributable to minority interest and excluding all extraordinary items.

For a private limited company, a minimum paid-up capital is only RM2.

Source: http://www.klse.com.my/website/listing/comparisons.htm, as at 23 October 2004.

Table 2.5 Number of listed companies on the KLSE: 1993-2003

Year	No of listed companies				Listed market valuation (RM million)				Total volume tradeable (million units)				Total value tradeable (RM million)			
	MB	SB	MM	Total	MB	SB	MM	Total	MB	SB	MM	Total	MB	SB	MM	Total
1993	329	84	-	413	606,081	13,556	-	619,637	105,011	2,745	-	107,756	372,633	14,642	-	387,275
1994	347	131	-	478	492,987	15,864	-	508,851	58,748	1,395	-	60,143	318,252	9,805	-	328,057
1995	369	160	-	529	542,926	22,702	-	565,628	30,902	3,077	-	33,979	157,982	20,877	-	178,859
1996	413	208	-	621	745,999	60,775	-	806,774	47,422	19,039	-	66,461	278,204	185,061	-	463,265
1997	444	264	-	708	354,374	21,632	-	376,006	62,302	10,497	-	72,799	299,599	108,959	-	408,558
1998	454	282	-	736	353,369	21,147	-	374,517	54,298	6,552	-	60,850	106,586	15,575	-	122,161
1999	474	283	-	757	527,567	25,124	-	552,691	84,439	5,710	-	90,149	184,421	15,207	-	199,629
2000	499	296	-	795	423,851	20,502	-	444,352	66,326	9,083	-	75,409	211,806	32,248	-	244,054
2001	520	292	-	812	444,312	20,677	-	464,989	48,460	6,489	-	54,949	85,591	10,425	-	96,016
2002	561	292	12	865	464,465	16,380	773	481,617	53,138	9,066	540	62,745	115,963	15,627	266	131,855
Up to 31/3/03	568	289	17	874	461,550	15,542	1,111	478,203	11,951	1,757	230	13,938	21,845	1,994	111	23,950

Note:

MB, SB, and MM refer to Main Board, Second Board, and MESDAQ Market, respectively.

Source: Investors Digest and KLSE Statistics (March 2003).

2.3.3 Reporting framework and IPO regulations

New issues of corporate and government securities that are offered to the public through an IPO are governed under the prospectus provisions of the Securities Commission Act of 1993. Within the period of this study (1989 to 2003 inclusive), there were significant changes in regulations pertaining to the offer of securities. Prior to 1996, a merit-based regulatory regime was used to examine the merits of each capital issue proposal, in order to make a judgement on the viability of the company and to decide on the suitability of a company for listing. Under this regime, the *pricing* of new issues was fixed and set out by the SC, in which the prospective price/earnings (P/E) ratio agreed between the company and its underwriter had to fall within a certain boundary. For example, the P/E ratio for the Trading/Services sector from February 1992 to December 1995 had to be within a range of 4 to 11. These issue prices were usually at levels below market prices, resulting in large over-subscription rates[29] on Malaysian IPOs. Fixed IPO pricing is usually based on the need to protect the interest of minority shareholders. Similar binding regulatory constraints were implemented in Korea and India before 1988 and until 1992, respectively (Chowdhry and Sherman, 1996b).

In order to enhance corporate governance and strengthen the regulatory framework of the primary market, the disclosure-based regulatory regime (DBR) was implemented after 1995 on a phased basis. In March 2003, the SC completed the transition from a merit-based to a DBR for fund-raising. Effective from 1 May 2003, seven fund-raising guidelines related to the offer of securities, private debt and asset-backed securities, call

[29] Wan-Hussin (2001) reports the average over-subscription rate in Malaysia for the period 1990 to 2000 is 40.9%.

warrants, asset valuations, prospectus and unit trust funds were revised by the SC to enhance corporate governance (Securities Commission Press Release, 31 March 2003).

In order to increase transparency, it is compulsory for IPO companies to disclose timely, accurate and material information on their corporate performance to potential investors. Unlike the UK, Canada and Hong Kong, which have voluntary earnings forecast disclosure, however, it is *mandatory* for the Malaysian IPO companies to provide earnings forecasts for their next financial year end in their prospectus.[30]

With effect from January 1996, a revised regulation on earnings forecasts was introduced, requiring both the major shareholders and promoters of the companies seeking a listing on the Main Board involved in construction, services,[31] and specialised[32] activities and on the Second Board, to choose for either a three-year profit guarantee or a three-year share moratorium.[33] The role of the profit guarantee or share moratorium is to protect IPO investors from being expropriated by the controlling shareholders and to align their interests, thus maximising the value of the company (Wan-Hussin, 2001).[34]

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[30] Another country that has mandatory forecast disclosure in the prospectus after 1983 is New Zealand (Jaggi, 1997).

[31] Services activities comprise Finance, Hotels, Properties, and Trading sectors.

[32] Specialised activities comprise Mining, Plantation and Trusts sectors.

[33] Share moratorium is called a lock-up in the US and a lock-in in the UK.

[34] Wan-Hussin (2001) provides detail investigations on IPO profit guarantee and share moratorium.

Under the profit guarantee agreement, the major shareholders and promoters of the affected companies have to provide a guarantee that the company will achieve 90% of the profits forecast in the prospectus, and 90% of the forecast profits for the two years following the official listing. The guarantee can be in the form of either a bank guarantee or the placement of shares by the major shareholders (the guarantors) with an independent third party. The guarantors have to compensate the company for any shortfalls in the guaranteed profit. This is one of the unique features of Malaysian IPOs that make them different from the rest of the world. As an alternative to guaranteeing profits, the affected major shareholders and promoters of the Main Board and Second Board applicant companies must agree not to sell, transfer or assign any of their shareholdings in the company within one year of the official listing. Thereafter they can sell, transfer or assign a maximum of 20% (15%) for the Main Board (Second Board) applicant companies per annum (Policies and Guidelines on Issue/Offer of Securities, Guidance Notes 10-19).

Since 1 July 1997, the profit guarantee in the form of a bank guarantee was made mandatory for all Second Board applicant companies (Updates and Revisions to the Policies on Issues/Offer of Securities). It was subsequently abolished in April 1999 due to the difficulty in obtaining bank guarantees and a tightening of credit policy resulting from unfavourable economic conditions (Wan-Hussin, 2001). As a replacement for this, a moratorium on selling shares is now a standard requirement. Promoters of the affected companies are not allowed to sell, transfer or assign their respective shareholdings amounting to 45% of the enlarged issued and paid-up capital of the company for at least one year from the date of listing. Thereafter they are allowed to sell, transfer or assign only up to a maximum of one-third per annum of the shares under moratorium (Revised Requirement Profit Guarantee/Moratorium on Disposal of Shares

on 30 April 1999). These share moratorium structures are different from those in the US market, which are generally for a shorter period (180 days) and lock-in a greater percentage of shares (Wan Hussin, 2001). However, the lock-in period in the UK ranges from six months to about three years. In addition, the lock-in agreements in the UK are more complex and diverse than in the US (Espenlaub, Goergen and Khurshed, 2001). Another difference is that lock-in agreements are compulsory (for certain companies) in Malaysia, but not in the UK and the US.

A company is also required to provide explanations for any deviation of 10% or more between the reported profit after tax and minority interest in the audited accounts following the IPO and any forecasts previously made in the prospectus (Chapter 9, KLSE Listing Requirements). For any new issue of shares, the identity, compensation, equity ownership and background of directors and senior managers also needs to be disclosed in the prospectus.

After the company has been listed, the company is required to publish quarterly reports, income statements, annual reports, annual audited financial statements, and auditors' and directors' reports. The quarterly reports or the interim financial statements need to be disclosed not later than two months after the end of each quarter of a financial year. These interim financial statements report the consolidated and comparative figures for the prior year. However, they do not provide information on the financial status of companies' assets, liabilities and equities, or cash flows, and are not reviewed by external auditors. The quarterly income statements need to be prepared for the current quarter and cumulatively for the current fiscal year-to-date of the immediately preceding financial year. In addition, the listed company needs to issue an annual report together with the annual audited financial statements, and auditors' and directors'

reports within a period not exceeding four months of the close of the financial year of the listed company.

All Malaysian companies have to accord with the approved accounting standard of the Malaysian Accounting Standard Board (MASB) and the Ninth Schedules of the Companies Act, 1965, in preparing and presenting their financial statements. Since the late 1970s, Malaysia has adopted accounting standards that are generally consistent with those issued by the International Accounting Standards (IASs) Committee. The approved accounting standards that constitute the Malaysian Generally Accepted Accounting Principles (GAAP) consist of IASs adopted[35] in Malaysia and Malaysian Accounting Standards (MASs) issued in Malaysia. Topics not dealt with in IASs are covered in MASs. The Malaysian Accounting Standard Board (MASB), which came into existence during the second half of 1997, is now the sole authority for setting accounting standards for Malaysia. The MASB was established under the Financial Reporting Act 1997.

Section 169(4) of the Companies Act requires companies' profit and loss accounts and the balance sheets to be audited and certified by an independent external auditor. Under the reporting framework of approved auditing standards[36] in Malaysia and the

[35] Twenty-five out of thirty-one IAS standards had been adopted in Malaysia by early 1998.

[36] The approved auditing standards in Malaysia are based on the International Standards on Auditing (IASs).

Companies Act, the auditor is responsible for providing unqualified or qualified reports on the companies' financial statements.[37]

A requirement also exists for a company to disclose the composition of equity ownership in the company under Part II of the Eighth Schedules of the Companies Act 1965. Many Malaysian listed companies are owned by controlling[38] and substantial shareholders, which may influence the appointment of chief executive officers. Furthermore, many of these shareholders are 'family' related, so they may be able to influence the policies and directions of the company. The Securities Industry (Reporting of Substantial Shareholding) Regulations 1998, which came into operation on 1 May 1998, define a substantial shareholder in the company as any person or institution having 5% or more of the nominal value of the voting shares in the company (Regulation 7). However, effective from 1 November 1998, Regulation 7 of the Securities Industry (Reporting of Substantial Shareholding) Regulations 1998 was amended. Under the new Regulation 7A, any person or institution having not less than 2% of the nominal value of all the voting shares in the company is regarded as a substantial shareholder. Subsequently, effective from 1 August 2001, Regulation 7A was deleted. Based on the Securities Industry (Reporting of Substantial Shareholding)

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[37] Unqualified reports are given when the auditor feels the company has followed all accounting rules appropriately and that the financial reports are a true and fair representation of the company's financial condition. Meanwhile, qualified opinion is given when some limitations exist, such as an inability to gather certain information or a significant upcoming event, which may or may not occur. In this situation, a qualified report is produced because the auditor is unable to report affirmatively on those matters required under the reporting framework.

[38] A controlling shareholder is someone who can exercise the majority of votes in the election of directors (Ow-Yong and Kooi Guan, 2000, footnote 9). Goergen (1998) defines the controlling shareholder as the largest shareholder holding at least 25% of the voting equity (p. 113). Therefore, it is likely that the controlling shareholder may be in a position to determine the outcome of certain matters requiring shareholders' approval, unless they abstain from voting by law and/or the relevant authorities.

(Amendment) Regulations 2001, an ownership stake of 5% is applied in defining a substantial shareholder.

2.4 The Malaysian IPO market[39]

2.4.1 Reasons for companies listing on Bursa Malaysia

An initial public offering (IPO) is also sometimes known as 'going public'. This is when a company that has previously been privately-owned offers its shares to the public in the first instance. Even though companies may have different reasons for seeking a listing on the Bursa Malaysia, the primary reason is to raise capital for the expansion of business operations. It is an alternative to borrowing from banks. Another important motive for going public in Malaysia is ownership diversification.

Several other reasons for going public are to achieve a higher profile than unlisted companies through the publicity generated by stock-broking companies, which eventually helps to stimulate the company's growth and attract new business. In addition, investors tend to have greater confidence in public listed companies because the company has to fulfil stringent listing requirements before being listed on the Bursa Malaysia. The company can raise more funds from existing shareholders via rights issues and loan stocks for business expansion, new projects or reducing debt. Furthermore, due to the increased publicity about their activities, listed companies may be in a better position to expand their operations overseas.

[39] The descriptions are based on the SC Policies and Guidelines on Issue/Offer of Securities, KLSE Listing Requirements, Paudyal *et al.* (1998), Jelic *et al.* (2001), Wan-Hussin (2001), Koh (2004) and SC Publication 'Capital Market Masterplan', SC and Bursa Malaysia websites.

2.4.2 Features of Malaysian IPOs and the listing process

Apart from the SC intervention on IPO pricing prior to 1996, the imposition of the IPO profit guarantee from 1996 to 1999 for certain companies, and the mandatory earnings forecasts disclosure in the IPO prospectus, as discussed in the previous section, there are several other unique features of the Malaysian IPO market that differentiates it from other markets. The most important feature is that companies making IPOs are required by law to reserve 30% of shares allocated to the public to be set aside for Bumiputera applicants. However, these share allocations do not need to be approved by the Ministry of International Trade and Industry (MITI) or other government agencies. The aim of this requirement is to increase Bumiputera ownership in the corporate sector. However, companies which are controlled by Bumiputera do not have to comply with this allocation requirement.[40] A portion of shares are also reserved for Bumiputera investors approved by the MITI or other government agencies. Apart from allocating the shares to the Malaysian public and Bumiputera applicants, companies may also allocate some of the shares to their directors, employees, and others who have contributed to the success of the company, such as suppliers, distributors, dealers or customers.[41]

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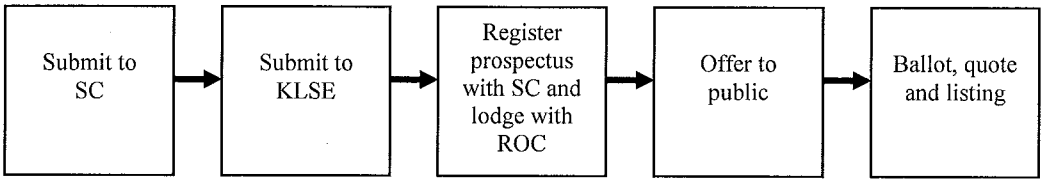
[40] SC defines the Bumiputera control companies as those in which: (i) at least 51% of the company's equities are owned by Bumiputera shareholders; or (ii) at least 35% of company's equity is owned by Bumiputera shareholders, chairman, chief executive officer, and managing director. In addition, at least 50% of the board of directors are Bumiputera.

[41] Wan-Hussin (2001) reports that during the period 1996-2000, approximately 12% of enlarged issued and paid-up share capital of IPO company upon listing is allocated to the Malaysian public, 3% to the employee, directors, and others person who have contributed to the success of the companies, 6% to government-approved Bumiputera investors and 1% to others (mostly institutional investors or shareholders of other companies within the group).

There are two common types of IPOs in Malaysia. The first type is the new issue of shares, which is also known as a 'public offer'. The second type is an 'offer for sale' of existing shares which have not previously been traded by one or more existing shareholders. Several companies also make a combination of public offers and offers for sale of existing shares, which is referred to as a mixed or combination offering. Under a combination offering, the sale of shares is partially from the issuing company and partially from existing shareholders. The absolute holdings of the existing shareholders are not affected in a public offer since new shares are being offered. However, this will reduce their percentage holdings in the company. On the other hand, in an 'offer for sale', both the absolute holdings and the percentage holdings of the existing shareholders in the company are affected and reduced. Furthermore, the gross proceeds raised from public offers which provide new investment capital will go to the company, but gross proceeds raised from offers for sale go directly to the owners of the shares. Conversely, the proceeds of the combination offerings will go partly to the issuing company and partly to selling shareholders. However, there is no minimum level for the public offer which can take the form of new and/or existing shares (Amendments to Policies and Guidelines on Issue/Offer of Securities, as at 3 September 2001).

The listing process for Malaysian IPOs is illustrated in Figure 2.3. Prior to May 2003, the IPO processing time was approximately eight to twelve months (Jelic *et al.*, 2001). The procedure is extensive compared to that of most other markets (Paudyal *et al.*, 1998). However, in order to spur the efficiency of capital raising, the processing time for submissions received from May 1, 2003 onwards was reduced to three months.

Figure 2.3 The IPO listing process



Source: Capital Market Masterplan, p. 24.

Permission for a listing is first obtained from the Ministry of International Trade and Industry (MITI) and the Foreign Investment Committee (FIC). In order for a company to be listed on the KLSE, it has to submit a listing application to the Securities Commission (SC) together with a draft copy of the prospectus, once the application has been approved by the MITI and the FIC. Prior approval from the SC is required for all corporate proposals which involve issues or offers of securities to the public. A financial and qualitative evaluation of the company, such as the profits and dividend forecasts, has to be made to the SC. Once the application of issuance and listing of securities has been approved by the SC, the company will file with the KLSE its listing application, together with supporting documents and articles of association. The final copies of the prospectus are then filed with the relevant authorities. The KLSE requires the company to provide to the KLSE a number of copies of the printed prospectus. The company then issues and advertises it, thereby inviting members of the public to apply for the company's shares. Similar to the practice used in the UK, prior to the formal invitation to the public to apply for shares, the subscription price of the IPO must be set as agreed between the company and its lead underwriter, and stated in the prospectus.[42] The full prospectus and application forms must be published in a widely-circulated

[42] As mentioned in Section 2.3, before January 1996, the IPO subscription price was determined by the SC, based on a range of prospective price/earnings (P/E) ratio that was set for each industry. The prospective earnings were based on the earnings forecast for the first financial year of listing. However, since January 1996 when the disclosure-based regulatory regime was introduced, the IPO subscription prices are more market-driven.

daily Malay language (Bahasa Malaysia) newspaper and an English language newspaper if a company seeks a listing on the Main Board. However, only a summary of the prospectus should be published if a company seeks a listing on the Second Board. Following the rationalisation of SC Guidelines in respect of Listing Requirements, effective from 1 September 2003, the requirements for advertising the prospectus in a widely-circulated newspaper have been abolished.

Underwriting arrangements must be in place before the offering of securities is made to the general public. Underwriting may be arranged in terms of a minimum level of subscription, which should be determined by the issuer and must be disclosed in the submission to the SC and in the prospectus issued in conjunction with the IPO, together with the basis for determining the minimum level of subscription. The principal adviser making the IPO application to the SC has to be part of the syndicate of underwriters who underwrite the securities offered under the IPO. The full list of underwriters, together with their respective commitments, should then be submitted by the principal adviser to the SC for its records.

The company has to announce the level of subscription and the basis of allocation if the listing entails an offer of securities to the public. As highlighted earlier, at least 30% of the shares offered should be allocated to Bumiputera investors (local indigenous people) upon listing. This requirement is to comply with the National Development Policy (NDP). This is one of the unique features of Malaysian IPOs, which makes the IPO market different from that in other markets. As noted by Corhay *et al.* (2002), this policy could provide an explanation for the high underpricing of Malaysian IPOs, given the political need to transfer wealth to the Bumiputera investors (p. 55). Apart from the unique features of Malaysian IPOs on share allocation, an interesting feature which is

similar to the UK, Hong Kong, Singapore, Indonesia, Thailand, and Bangladesh, among others, is that issuers tend to favour small over large investors (Chowdhry and Sherman, 1996a).

Similar to the UK listing requirements, a company must ensure that, upon listing, at least 25% of its issued and paid-up capital is in the hands of public shareholders. As of January 2005, the minimum number of public shareholders upon listing must be at least 1,000, each holding not less than 100 shares. The employees of an applicant company, its subsidiaries and the holding company are not excluded from the minimum number of public shareholders. All the shares of an applicant company which are held by employees and Bumiputera investors for the purpose of compliance with the NDP can make up the 25% public spread (Chapter 3.05, Bursa Malaysia Listing Requirements).

In Malaysia, most companies issuing shares use a firm commitment contract, and such offerings use a fixed price approach.[43] Under this method, investors specify the number of shares for which they wish to subscribe at the pre-announced subscription price. Apart from fixed price offerings, the hybrid pricing method (which comprises both fixed and auction pricing) and the book-building method are also used in Malaysia.[44] In auction pricing, the price is set after bids are submitted, while in book-building an offer price is set after the underwriters canvas potential buyers to establish how many shares they want and how much they are prepared to pay (Ritter, 2003).

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[43] Loughran, Ritter and Rydqvist (1994) find that countries employing fixed price offerings usually have more underpricing than in countries employing book-building methods.

[44] Wan-Hussin (2001) reports that the number of companies that used hybrid pricing during the period 1990 to 2000 is only 1% (seven privatisation companies). On the other hand, the book-building method was first used in 1995 and subsequently adopted by four IPC companies.

With a firm commitment contract, the underwriters guarantee to buy all the shares at the offer price, less the underwriter's discount. If the issue is undersold, the underwriting syndicate faces a market risk for these shares (Fishe, 2002). However, only IPO shares that are made available for subscription by the investing public are fully underwritten in Malaysia. IPO shares reserved for Bumiputera investors and approved by MITI or government agencies, and for eligible directors, employees, customers and suppliers of the IPO company, are not required to be underwritten.

In order for investors to apply for shares, share application forms for new public issues have been made available in newspapers since 1994. Similar to the UK, Hong Kong, Australia, and Singapore, among others, potential investors are required to pay in advance for all shares for which they bid (Chowdhry and Sherman, 1996b). The members of the board of directors, representatives from the Malaysian Industrial Development Finance Consultancy and Corporate Services (MIDFCCS), MITI, the FIC and the SC meet after the closing of the share application date to agree on the basis for allotting the shares. The applicants are sorted based on two criteria: (i) the number of shares they are applying for; and (ii) whether they are Bumiputera or non-Bumiputera investors.

Balloting is used to allocate oversubscribed IPO shares to the investing public. The balloting process is carried out in two different phases. In the first, Bumiputera investors are balloted, while in the second, all unsuccessful Bumiputera application forms are added to the public portion for the second balloting. By doing so, the probability of success for the Bumiputera investors is increased. In order to reduce the time involved and the cost incurred in the IPO process, an integrated electronic system has been introduced for each process of share application, balloting and refund of

monies. The computerised balloting using a random number generator computer has replaced the manual balloting since the end of 1995. Therefore, the public has an option to apply for shares either electronically or on paper. Investors who wish to apply electronically can use Automatic Teller Machine (ATM) cards to subscribe for shares at the ATM machines of participating financial institutions. Successful applicants have the shares credited into their Central Depository System (CDS) accounts, while unsuccessful applicants have their application monies credited back into their bank accounts. The integrated electronic system also involves the transmission of share application data from participating financial institutions to the issuing house, where computerised balloting is used to determine successful share applications during an IPO.

2.5 Summary

An overview of the Malaysian background and IPO market is provided in this chapter and demonstrates that Malaysia is unique due to its multicultural society. The existence of inequalities of wealth within Malaysian society as a result of its colonial heritage has made the IPO an important tool for redistributing wealth among ethnic groups. Since the country's independence in 1957, there have been significant developments in the Malaysian capital market. The Malaysian economy was in an upward trend prior to 1997 but was badly affected by the East Asian crisis of 1997-1998. However, the imposition of capital market controls and the pegging of the ringgit to the US dollar from September 1998 has improved the Malaysian economy.

There have also been many changes in the IPO market in terms of its regulation and activities over the period 1989 to 2003. The most important feature is that 30% of

shares made available to the public are allocated to Bumiputera investors as a part of the government's policy to increase Bumiputera involvement and ownership in the corporate sector. Another significant change is the pricing of IPOs, which has not been binding on the IPO regulator (SC) since 1996. One of the unique features of Malaysian IPOs is the imposition of profit guarantees to major shareholders or promoters which took place in 1996 to 1999. In addition, profit forecast disclosure in the prospectus is a mandatory requirement for Malaysian IPOs. Having discussed the background to Malaysian IPOs, the theories explaining the performance of IPO companies are provided in the next chapter.

Chapter 3

Theories of IPO performance

3.1 Introduction

The main focus of this thesis is on long run post-IPO performance. However, in view of the potential link between IPO underpricing and long run underperformance, this chapter reviews the various existing hypotheses concerning both phenomena, focusing on market players involved in the IPO process: issuers, underwriters[45] and investors. The rest of the chapter is organised as follows: Section 3.2 discusses the theories of IPO underpricing, while Section 3.3 presents the explanation for IPO underperformance. The final section provides a summary of the chapter.

3.2 Theories of IPO underpricing

The best-known pattern is the occurrence of large initial returns[46] that are credited to investors in IPOs. A number of explanations have been advanced for the new issues underpricing phenomenon, with different theories focusing on various features of the relations between issuers, underwriters and investors. However, *'these [theories] are not mutually exclusive, and their relative importance differs across countries, contractual mechanisms and time'* (Ritter, 2003, p. 284). In addition, a given explanation can be more significant for some IPOs than for others. Following

[45] Several studies in the US use the term 'investment banker'.

[46] Initial returns or underpricing are used interchangeably.

Ljungqvist (2005),[47] the main theories discussed in this section are classified under four broad categories: (i) asymmetric information-based models; (ii) institutional reasons; (iii) ownership and control; and (iv) behavioural explanation (e.g., informational cascades).

3.2.1 Asymmetric information-based models

The asymmetric information-based models of underpricing assume that the investors, issuers, or underwriters have more information than the others. These models include the winner's curse, the book-building, the principal-agent models, and the signalling.

3.2.1.1 The winner's curse

The winner's curse model was introduced by Rock (1986). It is an equilibrium model for large underpricing of IPOs that relies on information asymmetry. He hypothesises that information about the value of the IPO company is distributed asymmetrically among underwriters and issuing companies and among informed and uninformed investors. According to Rock (1986), an informed investor is a person who has perfect information regarding the realised value of the new issue compared to the others. Informed investors subscribe to IPOs only in the situation where positive initial returns are available. However, uninformed investors will subscribe to every IPO, even though the IPOs may be overpriced. Therefore, uninformed investors are said to face a 'winner's curse', in which they may obtain all the shares they request because informed investors do not want the shares. This problem exists when informed investors crowd

[47] Ljungqvist (2005) provides a detailed review of theories of IPO underpricing.

out uninformed investors if good issues are offered. As a result, across many offerings uninformed investors receive an average return that is weighted towards overpriced offerings. Due to this, they may not be willing to bid for IPO shares. In order to attract them to purchase the shares and ensure their continued participation in the IPO market, all IPOs must be underpriced. The idea of winner's curse model has produced several testable hypotheses and empirical evidence, as summarised in Table 3.1.

Table 3.1 Hypotheses and evidence from the winner's curse explanation of underpricing

Source	Hypothesis	Empirical evidence	
Rock (1986)	The abnormal initial returns for uninformed investors are zero when adjusted for rationing, which is just enough to ensure their continued participation in the IPO market.	Supporting	Koh and Walter (1989) Levis (1990) Keloharju (1993) Lee, Taylor and Walter (1996a) Huang (1999)
		Contradicting	Khurshed, Mudambi and Goergen (1999) Amihud, Hauser and Kirsh (2003)
Michaely and Shaw (1994)	Underpricing is lower if information is distributed more homogeneously across investor groups.	Supporting	Michaely and Shaw (1994)
Ritter (1984) Beatty and Ritter (1986)	The greater the ex ante uncertainty about the value of the IPO company, the higher is the expected underpricing. Numerous proxies are used to measure ex ante uncertainty (e.g., age of the company, IPO gross proceeds, reputation of underwriters, and earnings forecast).	Supporting	Ritter (1991) Keasey and Short (1992) Kiymaz (2000)
		Contradicting	McGuinness (1992)
Beatty and Ritter (1986)	Underwriters that underprice too much (too little) will lose business from issuers (investors).	Supporting	Beatty and Ritter (1986) Nanda and Yun (1997) Dunbar (2000)
Booth and Smith (1986) Carter and Manaster (1990) Titman and Trueman (1986)	Underpricing can be reduced by minimising the information asymmetry by means of choosing a prestigious underwriter and a reputable auditor.	Supporting	Carter and Manaster (1990) Michaely and Shaw (1994) Carter, Dark and Singh (1998) Habib and Ljungqvist (2001)
		Contradicting	McGuinness (1992) Beatty and Welch (1996)

Source: Ljungqvist (2005) and the papers published by the authors.

3.2.1.2 Book-building

The book-building model of Benveniste and Spindt (1989) suggests that underwriters play a major role in extracting information about pre-market indications of interest on the demand for the IPO shares from better informed investors. This information is gathered before the issue price is finalised when the book-building method is used. Extraction of such information allows the underwriter to set a higher offer price for the issue. This theory suggests that if the better informed investors have private information, the pre-market demand of interest from them is greater in more underpriced issues. In order to induce them to reveal their information truthfully, the underwriter allocates more shares in IPOs that have a stronger pre-market demand. The shares are also more likely to have higher first day returns, to compensate them. This theory is supported by Aggarwal, Prabhala and Puri (2002).

Benveniste and Busaba (1997) show that the expected offer price under the book-building method is higher than in a fixed price offer, and this may be due to a 'cascade' inherent in fixed price offer. Therefore, the level of underpricing is lower in book-building than in the fixed price offer.

3.2.1.3 Principal-agent models

The Baron and Holmstrom (1980), and Baron (1982), agency model assumes that underwriters are better informed about demand conditions than the issuers. In addition, the reputations of underwriters may facilitate confirmation of the quality of issues and create demand. Due to the fact that issuers are unsure about the equilibrium price of their securities, they may assign the pricing decision to the underwriters. Because of

limited information, underwriters may determine an offer price which is not in the issuers' interests. This creates a principal-agent problem between issuers and underwriters due to the fact that underwriters may use underpricing to limit the cost of distributing the issue and ensure a successful one.

3.2.1.4 Signalling

Allen and Faulhaber (1989), Grinblatt and Hwang (1989), and Welch (1989) have argued that underpricing is used by issuers as a means to signal the quality of their company to the market. Their models assume that the issuers are better informed about the present value of their future cash flows than investors or underwriters. Grinblatt and Hwang (1989) develop a signalling model with two signals to explain IPO underpricing. They suggest that the percentage of insiders' retained ownership as well as the offering price both convey the unobservable 'intrinsic value' of the company and the variance of its future cash flows to investors. Welch's (1989) model posits that 'high quality' companies underprice their stock at the time of the IPO in order to obtain a higher price at seasoned offerings. Then, when the market price is established and the information asymmetry is reduced, companies conduct a seasoned offering.

3.2.2 Institutional theories

There are two main institutional theories that may provide explanations for the underpricing phenomenon; these are legal liability and underwriters' price stabilisation.

3.2.2.1 Legal liability

The legal liability hypothesis suggests that issuing companies may underprice their IPOs to limit their exposure to potential lawsuits from shareholders due to incorrect or insufficient information in their prospectuses. Tinic (1988) develops this hypothesis and finds results that support his hypothesis. However, Keloharju (1993) finds that the initial returns of his sample of IPOs are unrelated to lawsuit avoidance.

3.2.2.2 Price stabilisation

Price stabilisation is the practice whereby an underwriter goes into the secondary market to support the IPO price once the IPO starts trading in order to reduce price drops within a few days or weeks following IPO. As argued by Ruud (1993), IPOs are not deliberately underpriced but are priced at the expected market value, but underwriters support those offerings whose prices fall below the offer price. Therefore, a positive average price jump may be observed, suggesting higher underpricing.

3.2.3 Ownership and control theories

In conjunction with an IPO, there is normally a substantial change in a company's control and ownership structure (Goergen, 1998). A reduction in management ownership following an IPO is associated with an increase in the conflict of interest between managers and shareholders, which leads to an increase in agency cost. As argued by Jensen and Meckling (1976), managers may use a company's assets for their own benefit and have an incentive to consume any perquisites rather than maximising shareholder wealth. Jensen and Meckling (1976) define agency costs as the sum of: (i) the monitoring expenditures by the principal; (ii) the bonding expenditures by the agent;

and (iii) the residual loss. Fama and Jensen (1983) argue that the residual loss may be incurred if the cost of the full enforcement of contracts exceeds the benefits.

Ownership and control theories suggest two opposing views of underpricing, namely that it is a means to: (i) retain control; or (ii) reduce agency costs. The first view is developed by Brennan and Franks (1997), who suggest that underpricing is used to ensure over-subscription which allows managers both to ration the allocation of shares in favour of small rather than large investors, and to discriminate between applicants. They argue that managers may avoid allocating large blocks of shares to outside investors in order to reduce external monitoring of the non-value maximising behaviour of managers. This leads to investors holding smaller stakes in the company and allows managers to effectively retain control. The second view, developed by Stoughton and Zechner (1998), ignores control considerations. Their model suggests that underpricing and rationing in favour of large shareholders may enable them to better monitor managerial actions, which then reduces agency costs, with a net gain to the issuer.

3.2.4 Behavioural explanation (informational cascades)

The most widely stated explanation under the behavioural theories is '*informational cascades*'. According to Welch (1992), IPO prices are discounted to avoid information cascades (or bandwagon effects) in which potential investors follow other investors' purchasing habits. An investor may decide not to buy if other investors are not buying the shares. In order to avoid such behaviour, an issuer may underprice the IPO share to influence the first few investors to buy, thereby inducing others to follow suit.

In summary, as argued by Ljungqvist (2005), most of empirical evidence supports the asymmetric information-based model's explanation of underpricing. He suggests that the evidence supporting the institutional theories are mixed due to the fact that underpricing can still be observed in countries which have no litigation and no price stabilisation role in the IPO market. On the other hand, he argues that the ownership and control, as well as the behavioural theories are relatively new and the least explored explanations of IPO underpricing. In addition, Ritter (2003) argues that the relative importance of different theories of underpricing has changed over time and varies, depending upon the institutional setup.

3.3 Theories of IPO underperformance

Another pattern associated with IPOs is that IPOs generally underperform in the long run (Ritter, 2003). A number of theories have been proposed to provide explanations for the phenomenon of the long run underperformance of IPOs. However, Jakobsen and Sorensen (2001) note that there exists no convincing theory that explains the long run underperformance of IPOs. The theories of underperformance (either stock returns or operating performance) that are discussed in this section are classified under three broad categories: (i) long run performance in theories of underpricing (e.g., asymmetric information-signalling); (ii) behavioural explanations of long run underperformance; and (iii) measurement problems.

3.3.1 Long run performance in theories of underpricing

Two main theories of underpricing that may explain the long run performance are signalling and agency cost.

3.3.1.1 Signalling

As mentioned in Section 3.2.1.4, underpricing may be used as a tool to signal the quality of issuers to the market (Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989; Welch, 1989). Allen and Faulhaber (1989), Grinblatt and Hwang (1989) and Welch (1989) use the initial offering price to represent a signal of high quality issuers. Grinblatt and Hwang (1989) also indicate a low fraction of equity being floated to represent this. A signalling model assumes that high quality issuers whose quality is not otherwise known by the market tend to underprice their shares at the time of IPOs. The 'high quality' issuers then conduct a seasoned equity offering when the market price is established after their quality is 'discovered' by investors, to recoup opportunity losses at the time of the IPO. Meanwhile, Grinblatt and Hwang (1989) assume that high quality issuers float a low fraction of equity at the time of IPO at a lower offering price and sell the remaining stake at a higher price later. Therefore, according to the signalling theory, companies with larger underpricing and those that issue a smaller equity stake at the time of IPO should experience better post-IPO stock market and operating performance in comparison to other IPO companies.

3.3.1.2 Agency cost: separation of ownership and control

As mentioned in Section 3.2.3, when a company makes an IPO, it is typically accompanied by a reduction in management ownership, with an associated increase in agency costs. The agency hypothesis posits that lower ownership retention by managers reduces their incentive to embark on value maximising projects and increases their incentive to engage in behaviour that benefits them at the expense of shareholders. These agency costs may explain declines in long run operating performance if

managers' equity stakes are reduced at flotation. On the other hand, when managerial equity stakes after flotation are greater, the company may perform better in the long run. Therefore, this hypothesis predicts that the long run operating performance of IPO companies is relatively lower (higher) for companies that have lower (higher) managerial ownership. Jenkinson and Ljungqvist (2001) argue that in a semi-strong efficient market, long run stock market performance cannot be explained by agency costs due to the fact that *'worsening agency problems should not come as a surprise and thus should not be reflected in poor returns'* (p. 148).

3.3.2 Behavioural explanations of long run underperformance

3.3.2.1 Divergence of opinion

The divergence of opinion explanation of the long run stock market underperformance has been presented by Miller (1977). It suggests that investors may have been too optimistic about the future cash flows and growth potential of the companies that went public. Investors overestimate the new public company's prospects, especially for small and high growth companies, at the time of offering. Investors will buy an IPO if they are optimistic about its value. The valuations of optimistic investors will be much higher than the valuations of their pessimistic counterparts if there is a large amount of uncertainty about the value of an IPO. The divergence of opinion between optimistic and pessimistic investors will narrow as time goes by because more information about the IPOs is obtainable. The optimistic investors then adjust their beliefs about the value of the company which lead to a fall in stock price (Ritter, 1998). Therefore, the initial extent of divergence of opinion is negatively related to the long run stock market performance.

3.3.2.2 Fads

The fads hypothesis, introduced by Aggarwal and Rivoli (1990), is an extension of Miller's (1977) divergence of opinion explanation. A fad is defined as a non-rational temporary overvaluation, above intrinsic values, which is caused by an over-optimism of investors that eventually bursts or causes a longer term decline in returns (Naceur and Ghanem, 2001, note 1). In contrast, speculation is rational economic behaviour (Camerer, 1989, cited in Mok and Hui, 1998, note 9). It argues that the market for IPOs is subject to fads, and IPOs are underpriced by underwriters to create the appearance of surplus demand (Ritter, 1998). After the high demand, fads begin to erode and expectations become re-aligned again. The share price then drops, which causes the underperformance. This hypothesis predicts that companies with the highest initial returns should have the lowest subsequent returns.

The fads hypothesis is similar to the overreaction hypothesis (De Bondt and Thaler, 1985, 1987), which suggests that participants in the market are short-sighted and ignore the long term trend of mean reversion of profitability. This is due to the fact that investors put too much weight on improvements in operating performance prior to IPOs. As a result, the first day trading prices are high. These transitory profit improvements are regarded as permanent improvements by investors. As time goes by, the information about the IPOs becomes available. Consequently, there is a downward adjustment of initial estimates of the future profitability which causes the stock price to decline in the long run.

3.3.2.3 Window of opportunity/timing

The window of opportunity/timing hypothesis introduced by Ritter (1991) and Loughran and Ritter (1995) is an extension of the fads hypothesis of Aggarwal and Rivoli (1990). They suggest that the long run underperformance of IPOs can be explained by investors' optimistic expectations upon issue and the downward adjustment of these expectations in the aftermarket. Loughran and Ritter (1997) advocate that most companies issue equity after large stock price increases. In addition, managers time their IPOs to coincide with a peak of the company operating performance, which may be temporary and unsustainable. Therefore, investors are likely to be disappointed by the declining post-IPO operating performance, which in turn causes the poor stock market performance. The window of opportunity hypothesis predicts that companies going public in periods with large number of IPOs are more likely to be overvalued than other IPOs. Therefore, the periods with large number of IPOs should be associated with the lowest long run returns.

3.3.2.4 Earnings management

Healy and Wahlen (1999) review the earnings management literature and its implications for standard setting and state that companies manage earnings '*to window-dress financial statements prior to public securities' offerings, to increase corporate managers' compensation and job security, to avoid violating lending contracts, or to reduce regulatory costs or to increase regulatory benefits*' (p. 367). Healy and Wahlen (1999) state that, *'earnings management occurs when managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic*

performance of the company or to influence contractual outcomes that depend on reported accounting numbers' (p. 368). Beneish (2001) notes much of the evidence of earnings management is dependent on company performance, suggesting that, *'earnings management is likely to be present when a company's performance is either unusually good or unusually bad'* (p. 5).

Prior to an IPO there is comparatively little information reaching investors, so they must rely heavily on the prospectus (Chaney and Lewis, 1995). This generates a strong motivation for managers to manage reported earnings in order to increase their offering proceeds (e.g., Teoh, Wong and Rao, 1998; Teoh, *et al.*, 1998a; Rangan, 1998). Teoh *et al.* (1998) argue that investors are unable to understand fully the extent to which IPO companies engage in earnings management.

Loughran and Ritter (1997) state that companies must plan in advance in order to manage earnings. The action might be either to hold back current earnings to confer a high growth rate in the future or to increase current earnings by borrowing against future earnings. Loughran and Ritter (1997) then argue that if the companies boost current earnings before issuing equity, this will expose companies to the possibility of declining stock returns post issue. In this situation, investors may overvalue new issues because of misinterpreted high earnings reported at the time of offerings and fail to realise that the earnings management symbolises a transitory increase in earnings (Teoh *et al.,* 1998a; Rangan, 1998). Therefore, investors are likely to be disappointed by the declining post-IPO operating performance and adjust their valuation downwards, which in turn causes the poor stock market performance.

3.3.3 Measurement problems

An alternative explanation of poor long run stock market performance is that the underperformance is not genuine but is merely a function of poor research design or measurement. The methodology employed in many of the early empirical long run stock market performance studies has been questioned by several researchers (e.g., Fama, 1998; Barber and Lyon, 1997; Kothari and Warner, 1997; Lyon *et al.*, 1999); in particular, the choice of benchmark in defining the expected returns, the measurement of long run returns, and the use of test statistics to assess the statistical significance of abnormal performance.

Ritter (1991) argues that long run underperformance may be due to a failure to adjust returns for time-varying systematic risk. Eckbo, Masulis and Norli (2000) also argue that the *'new equity puzzle'* is explained by a failure of the matched-company technique to provide a proper control for risk. Many studies of the long run share price performance of IPOs compare the returns on the IPO to the return on the market to compute abnormal returns. This assumes that all IPO companies have a beta equal to one. In reality, beta is not equal to one for all IPO companies and this creates a bias in estimating long run performance. For instance, if the beta of an IPO company is greater than one, a downward bias in performance or greater underperformance will occur when the market index drops (declining market) over the holding period. A similar situation will happen in a rising market, in which an upward bias in performance will occur. Aggarwal and Rivoli (1990) argue that market-adjusted returns that have been used in previous studies are possibly not abnormally low on a risk-adjusted basis.

Fama (1998) identifies an issue related to the benchmark, namely that the asset pricing models may be misspecified, referred to as the *'bad-model problem'*. This issue cannot be avoided as no benchmark model correctly prices all securities (Fama and French, 1992). Several studies employ the Fama and French (1993) three-factor model as an alternative to matching on a company-by-company basis. This is an Arbitrage Pricing Theory (APT) model incorporating a market factor, size and the book-to-market effect.

Barber and Lyon (1997) and Kothari and Warner (1997) comment on the measurement of long run returns. These studies conclude that there is misspecification of abnormal performance for randomly chosen companies. Barber and Lyon (1997) state that there are three possible biases that lead to this misspecification. The first is known as the *'new listing'* bias, which generally creates a positive bias in test statistics (Lyon *et al.*, 1999). It exists due to the fact that the market benchmark portfolio includes recent IPO companies. These IPO companies, which are known empirically to have abnormally low returns, tend to drive down the average market returns. The second possible bias is a *'rebalancing'* bias, which arises because the compound returns on the benchmark portfolio implicitly assume periodic portfolio rebalancing, with the proceeds of a delisted company equally allocated among the surviving members of the portfolio (Ritter, 1991, p. 8), whereas the returns of sample companies are compounded without rebalancing. The third possible bias is the *'skewness'* bias, which refers to the positive skewness of long run abnormal returns. Lyon *et al.* (1999) propose a skewness-adjusted *t*-statistic, with or without bootstrapping techniques, to account for the skewness bias. Both the rebalancing bias and the skewness bias generally create a negative bias in abnormal returns (Lyon *et al.*, 1999). The appearance of IPO underperformance may be due to both the second and third biases introduced by Barber and Lyon (1997).

The problems associated with test statistics have been highlighted by Brav (2000) and Mitchell and Stafford (2000). They argue that the test statistics in previous studies of long run performance using the event-time approach suffer from cross-sectional dependence of returns. This is because the long run performance of different companies may be correlated due to the fact that the returns are aggregated at the firm level. Problems arise in making statistical inference when the returns on individual IPOs overlap due to multi-year event-time returns being employed. Mitchell and Stafford (2000) recommend the calendar-time portfolio approach in order to account for the cross-sectional dependence of event-time abnormal returns. Under this approach, the return for each month is calculated based on a portfolio of IPO companies that have undergone an IPO during the previous three or five years (i.e. returns are aggregated on a monthly basis).

Finally, it is important to note that not all the theories of IPO underperformance can explain the underperformance of both stock market and operating performance. For example, certain behavioural explanations, such as the divergence of opinions and fads, and the measurement problems, can explain only poor long run stock market performance, while agency costs can explain only poor operating performance.

3.4 Summary

This chapter reviews the existing theories of IPO underpricing and underperformance. The main theories of underpricing include the asymmetric information-based models (e.g., the winner's curse, book-building, principal-agent models and signalling), the institutional reasons (e.g., legal liability and price stabilisation), the ownership and control reasons, and behavioural explanation (e.g., informational cascades). The

theories of underperformance, based on either stock returns or operating performance, include signalling and agency cost explanations, behavioural explanations based on divergence of opinion, fads, window of opportunity/timing, and earnings management, and also the measurement problems. Following this, the next chapter provides a review of empirical studies of stock market performance.

Chapter 4

Review of empirical studies and research hypotheses: Market-based performance

4.1 Introduction

Following the review of the theories of IPO performance in the previous chapter, this chapter provides a review of empirical studies concentrating on stock market performance. Although the focus of this study is to investigate long run stock market performance, the first section of this chapter also reviews initial performance. The review of the literature in this chapter is then applied to develop testable hypotheses concerning the stock market performance of IPOs, which are explained in the subsequent section, while the final section provides a summary of the chapter.

There are two strands of related literature on the stock market performance of IPO companies. The first focuses on IPOs in the private sector while the second analyses privatisation share issues (PIPOs), in which a public listing is used to transform part or all of the government's ownership in state-owned enterprises to private ownership. Even though some studies are restricted to the analysis of IPOs in general and do not differentiate between the private IPOs and PIPOs, Section 4.2 provides a review of IPOs in general that may comprise only private IPOs or a combination of private IPOs and PIPOs. Reviews of studies that differentiate between private IPOs and PIPOs, together with studies that only focus on PIPOs, are also provided in Section 4.3.

4.2 Prior studies on IPOs in general

4.2.1 Initial return performance

The underpricing (positive initial returns) of IPOs has been documented in many countries, both in developed markets and emerging ones. While the initial underpricing seems to be a common phenomenon in every stock market, the amount of underpricing varies from country to country. Loughran *et al.* (1994) summarise international evidence on initial returns from 25 countries and suggest that variations in the performance across different countries may be due to differences in regulations, contractual mechanisms, and the characteristics of IPO companies. Ritter (2003) updates and expands the analogous table in Loughran *et al.* (1994) and lists the average initial returns for 38 countries around the world.

Table 4.1 summarises selected empirical evidence on the phenomenon of underpricing in different countries, including Malaysia. The initial returns reported in the table have been calculated in either raw or adjusted form. As can be seen from this table, the initial return is higher in developing markets than that typically documented in developed markets.

The degree of underpricing, measured as the difference between the subscription price and the closing market price on the first trading day, varies from 4.5% in Israel (Kandel, Sarig and Wohl, 1999) to 289.2% in China (Mok and Hui, 1998). Kandel *et al.* (1999) use a sample of 28 auction IPOs and argue that new information released upon announcement of the auction may explain the observed positive initial returns. Their finding does not support the asymmetric information hypothesis. As noted by Ritter

(2003), in general, the use of auctions for pricing and allocating IPOs has been associated with low but positive initial returns. The level of underpricing is generally lower as compared to fixed price offers or book-building.

Among earlier studies in the US are Stoll and Curley (1970) and Ibbotson (1975). Stoll and Curley (1970) find an average underpricing of 42.4% for a sample of 205 IPOs during the calendar years 1957, 1959 and 1963. Ibbotson (1975) studies the risk-adjusted returns of 2,650 IPOs during the period 1960 to 1969. He reports a positive average initial performance of 11.4%. The results of these studies and the US evidence reported in Table 4.1 indicate that the US IPOs are underpriced.

Table 4.1 Selected empirical evidence on initial returns from IPOs

Country examined	Researcher(s)	Period of study	Sample size	Average initial returns (%)*
Australia	Lee, Taylor and Walter (1996b)	1976-1989	266	16.4
Australia	Balatbat *et al.* (2004)	1976-1993	313	15.5
China	Mok and Hui (1998)	1990-1993	87	289.2^
China	Mok and Hui (1998)	1990-1993	22	26.0#
China	Wang (2005)	1994-1999	747	271.9
Finland	Keloharju (1993)	1984-1989	80	8.7
Germany	Ljungqvist (1997)	1970-1993	180	9.2
Hong Kong	Dawson (1987)	1978-1983	21	13.8
Israel	Kandel *et al.* (1999)	1993-1994	28	4.5~
Japan	Cai and Wei (1997)	1971-1992	180	49.0
Japan	Beckman, Garner, Marshall and Okamura (2001)	1980-1998	216	31.5
Malaysia	Dawson (1987)	1978-1983	21	166.6
Malaysia	Yong (1991)	1983-1988	33	167.4
Malaysia	Ku Ismail, Zainal Abidin and Zainudin (1993)	1980-1989	63	114.6
Malaysia	Loughran *et al.* (1994)	1980-1991	132	80.3
Malaysia	Mohamad *et al.* (1994)+	1975-1990	65	135.0
Malaysia	Yong (1997)	1990-1994	224	75.0
Malaysia	Paudyal *et al.* (1998)	1984-1995	95	61.8
Malaysia	Jelic *et al.* (2001)	1980-1995	182	99.2
Malaysia	Wan-Hussin (2005)	1996-2000	154	83.0
New Zealand	Firth (1997)	1979-1987	143	25.9

continued on next page

Table 4.1 (*continued*) Selected empirical evidence on initial returns from IPOs

Country examined	Researcher(s)	Period of study	Sample size	Average initial returns (%)*
Philippines	Sullivan and Unite (2001)	1987-1997	104	22.7
Singapore	Dawson (1987)	1978-1983	39	39.4
Singapore	Lee *et al.* (1996a)	1973-1992	128	31.4
Switzerland	Kunz and Aggarwal (1994)	1983-1989	42	35.8
Taiwan	Huang (1999)	1971-1995	311	42.4
Thailand	Allen, Morkel-Kingsbury and Piboonthanakiat (1999)	1985-1992	151	63.5
Tunisia	Naceur and Ghanem (2001)	1990-1999	16	27.8
Turkey	Kiymaz (2000)	1990-1996	163	13.1
Turkey	Durukan (2002)	1990-1997	173	14.6
United Kingdom	Levis (1990)	1985-1988	123	8.6
United Kingdom	Keasey and Short (1992)	1984-1988	222	14.0
United Kingdom	Levis (1993)	1980-1988	713	14.3
United Kingdom	Brennan and Franks (1997)	1986-1989	43	9.4
United Kingdom	Espenlaub and Tonks (1998, 2000)	1986-1991	428	12.2
United Kingdom	Khurshed *et al.* (1999)	1991-1995	228	9.74
United Kingdom	Burrowers and Jones (2004)	1995-1997	125	16.9
United States	Stoll and Curley (1970)	1957,59,63[†]	205	42.4
United State	Ibbotson (1975)	1960-1969	2,650	11.4
United States	Ritter (1991)	1975-1984	1,526	14.3
United States	Ibbotson *et al.* (1994)	1960-1992	10,626	15.3
United States	Rajan and Servaes (1997)	1975-1987	2,725	10.0
United States	Carter *et al.* (1998)	1979-1991	2,292	8.1
United States	Krigman *et al.* (1999)	1988-1995	1,232	12.3

Note:

* Average initial returns are average (usually equally-weighted mean) returns calculated from the date of offering to aftermarket price. Some of initial returns are raw returns and some are adjusted for the market returns.

^ A-shares in Shanghai, reserved for domestic Chinese.

B-share in Shanghai, reserved for foreign investors.

~ Auction offers.

Source:

+ This figure was taken from Ariff, Mohamad and Nassir (1998). The rest of the figures were based on the papers published by the authors.

Evidence from the UK also finds positive initial returns. Levis (1990) reports average market adjusted returns of 8.6% for a total of 123 IPOs during the period 1985 to 1988. The level of underpricing is lower than that found in the US market. Based on these

results, the winner's curse hypothesis, tested by Levis (1990), has been supported. Keasey and Short (1992), who examine 222 UK IPOs floated on the Unlisted Securities Market (USM) in the period 1984 to 1988 via the placement[48] method, find an average underpricing of 14%. Their ordinary least squares (OLS) regression results show that the level of ex ante uncertainty[49] of a new issue does have some influence on the underpricing, which supports the ex ante uncertainty hypothesis of Beatty and Ritter (1986). Using a larger sample size and a longer period, Levis (1993) then provides evidence on 713 IPOs for the period 1980 to 1988, with an average initial return of 14.3%. This initial return is similar to the findings reported in Ritter (1991), even though these studies investigate different markets. Brennan and Franks (1997), Espenlaub and Tonks (1998, 2000), Khurshed *et al.* (1999), and Burrowers and Jones (2004) also find similar positive initial returns in the UK.

The underpricing phenomenon is not only found in the US and the UK but also in Malaysia, including Dawson (1987), Yong (1991), Ku Ismail *et al.* (1993), Loughran *et al.* (1994), Mohamad *et al.* (1994), Yong (1997), Paudyal *et al.* (1998), Jelic *et al.* (2001), and Wan-Hussin (2005). An early study by Dawson (1987), examines the average initial returns for a sample of 21 IPOs in Malaysia from 1978-1983. Besides analysing the Malaysian market, he also examines the Hong Kong and Singaporean markets, using a sample of 21 IPOs and 39 IPOs, respectively. He reports positive

[48] Under the placing method, the shares are 'placed' with the sponsor (issuing house or stockbroker) or broker at a predetermined offering price who then sells them to his/her clients at the same or marginally higher price (Keasey and Short, 1992, p. 459).

[49] They use the age of the company, the percentage of equity retained by pre-offering shareholders, the provision of earnings forecast, industry classification, the coefficient of variation of earnings for three years prior to flotation, the amount of net proceeds and the gross proceeds raised from an IPO as proxies for ex ante uncertainty.

average initial returns of 166.6%, 13.8% and 39.4% in Malaysia, Hong Kong, and Singapore after adjustment for the market indices using the KLSE Industrial Index, the Hong Kong Far East Stock Exchange 62 Stock Index, and the Singapore Stock Exchange All-Share Index. He also analyses stock price trends for IPOs in these three Asian stock markets from day one up to 12 months after listing. He finds that the price declines about 9.3% in Hong Kong and 2.7% in Singapore from the closing price on the first trading day. However, the decline in price is not significant. These results are supportive of the efficient market hypothesis. In contrast, a different pattern is present in Malaysia. The price increases by 18.2% in the 12 months from the closing price on the first day trading. Dawson (1987) interprets this to mean that the Malaysian market did not price the issue efficiently. He concludes that this may be due to the fact that the market index benchmark (KLSE Industrial Indices) used by him does not represent the entire market. Jelic *et al.* (2001) comment that these indices may not adequately reflect total market movements.

It would appear that the level of underpricing is higher in the Malaysian market than in the US and UK markets. However, less underpricing appears to exist in more recent studies. Loughran *et al.* (1994) suggest that the move in recent years by most East Asian countries to reduce regulatory interference in the setting of offering prices should result in less underpricing in the 1990s than in the 1980s. Corhay *et al.* (2002) comment that the lower degree of underpricing is due to the fact that the Malaysian market has become more mature and efficient. They argue that this is attributable to the efforts of the KLSE to carry out a complete revamp of the listing requirements in order to boost efficiency, improve corporate governance and increase transparency. A number of the objectives of the revamp comprise: (i) the combination of the Main Board listing requirements with the Second Board listing requirements for the purpose of aiding

clarity; (ii) strengthening the provisions for disclosure, financial reporting and corporate governance; (iii) rationalising the provisions of the listing requirements with the existing laws; and (iv) codifying unwritten procedures of the KLSE relating to listed companies (Corhay *et al.,* 2002, p. 63).

Overall, from the review of the literature examining the level of underpricing, positive initial returns are found in every stock market. The level of underpricing is relatively higher in a developing market than the developed market and varies from country to country.

4.2.2 Long run share price performance

4.2.2.1 Non-Malaysian studies

There is a growing number of studies that analyse the long run performance of IPOs. Most of the research has examined returns following IPOs or listing and compared them with returns earned by market benchmark or matching companies that have not carried out IPOs.[50] Loughran *et al.* (1994) review evidence from nine countries and conclude that IPOs have a tendency to offer relatively low returns in the long run. They report that companies that issue stock in IPOs significantly underperform relative to non-issuing companies for up to three to five years after the offer date (e.g., Ritter, 1991; Loughran and Ritter, 1995). This is the most recently identified stylised fact in which there is a tendency for new issues to underperform in the long run (Jenkinson and Ljungqvist, 2001). However, there is no consensus concerning the evidence of long run

[50] The period following IPO or listing varies. Generally, the most frequently used were three and five years.

underperformance as there is conflicting evidence. Ritter (2003) suggests that long run share price performance is sensitive to the methodology employed and the sample used.

A variety of methods have been used to measure long run performance. Analysis has focused either on event-time or calendar-time. An event-time approach is adopted when performance is measured relative to the date of the IPO. A calendar-time approach is adopted when, for each calendar month, the returns are obtained for each sample company that had an IPO event in the last post-event period of interest (e.g., three or five years). The portfolios of these companies are re-formed every month and the portfolio return in that month is then calculated. As a result, a time-series of portfolio returns is available to estimate the abnormal returns by using a model such as the Fama-French three-factor. The most widely used metrics in event-time analyses are the cumulative abnormal return (*CAR*), the buy-and-hold abnormal return (*BHAR*), and the wealth relative (*WR*). Since the work of Loughran and Ritter (1995), researchers have also undertaken calendar-time analysis by looking at the alpha of Fama-French (1993) three-factor model. The review of literature in this chapter is mainly focused on the above metrics, even though several researchers introduce alternative methods such as using a decomposition method (e.g., Jakobsen and Sorensen, 2001) or non-parametric tests of stochastic dominance (e.g., Ho, 2003).

Prior to the 1990s, research into the long run IPOs stock market performance is relatively less comprehensive, although all the studies find some evidence of negative performance in the long run for one to five years after listing (e.g., Stigler, 1964; Stoll and Curley, 1970; Shaw, 1971; Ibbotson, 1975). Studies in the US market in the 1990s on long run IPOs performance are more comprehensive, including, among others,

Aggarwal and Rivoli (1990), Ritter (1991), Loughran (1993), Loughran and Ritter (1995), Brav and Gompers (1997), and Gompers and Lerner (2003).

The most widely cited paper on IPO long run performance is based on the work of Ritter (1991) who examines the performance of 1,526 US IPO issued in 1975 to 1984. He finds that US IPOs significantly underperform the benchmarks in the three years subsequent to listings. Ritter (1991) reports that cumulative average matched company-adjusted returns, excluding the initial returns for 36 months after going public, are -29.1%. In his study, he uses alternative benchmark portfolios to find out whether measurement problems (choice of benchmarks) could account for the poor long run performance. Moreover, he tries to investigate the possible explanations for the underperformance by categorising his sample by gross proceeds, initial returns, industry, year of issuance, and age of the companies. He finds that subsequent underperformance is concentrated among comparatively young growth companies which went public during years of relatively high IPO activity. The patterns are consistent with an IPO market in which investors are periodically over-optimistic about the earnings potential of young growth companies or the future prospects of issuing companies. Companies are also found to take advantage of 'windows of opportunity' where they will go public when market conditions are most favourable to them whereby IPOs come to the market near market peaks. In sum, his findings support measurement problems (choice of benchmarks) and the fads hypotheses.

Another study by Loughran and Ritter (1995) examines the post issue performance of 4,753 IPOs for the period 1970 to 1990. They also find poor long run performance for investors of companies issuing IPOs. Investors received only 5.1% per year during the five years after equity issuance on IPO companies, compared to 11.8% on size-matched

companies. In the three years after the IPO, mean buy-and-hold returns on IPO companies are 8.4%, while the mean buy-and-hold returns on their matched companies are 35.3%. This indicates that the IPO companies underperform by 26.9% compared to the matched companies. This underperformance is higher when five-year windows are examined. Mean buy-and-hold return on IPO companies and matched are 15.7% and 66.4%, with underperformance of 50.7%. They also compute the long run performance using five common indices as benchmarks. The equally-weighted buy-and-hold abnormal return and wealth relative measures show that IPO companies underperform all the market benchmarks in different magnitudes. These results indicate that the measurement of long run performance is sensitive to the benchmark used. Loughran and Ritter (1995) use the Fama-French (1993) three-factor model to measure the long run performance. They divide their sample into large and small companies, and report that IPO companies underperform their matched companies in all sample groups when both are calculated using equal- and value-weighting schemes. Their findings support the window of opportunity hypothesis, in which companies go public when equity value is high (overvalued).

Following the work of Ritter (1991) and Loughran and Ritter (1995), researchers in the US, UK and from other markets have tried to investigate this long run return anomaly, including Loughran (1993), Carter *et al.* (1998), and Gompers and Lerner (2003) for the US market, and Levis (1993), Khurshed *et al.* (1999), and Espenlaub, Gregory and Tonks (2000) for the UK one. Studies from other markets include those carried out by Aggarwal, Leal and Hernandez (1993), Keloharju (1993), Hwang and Jayaraman (1995), Cai and Wei (1997), Firth (1997), Ljungqvist (1997), Page and Reyneke (1997), Huang (1999), Stehle, Ehrhardt and Przyborowsky (2000), Naceur and Ghanem (2001),

Kooli and Suret (2004), and Alvarez and Gonzalez (2005). In general, these studies find that IPO companies underperform the benchmarks in the three to five years period.

However, as mentioned earlier, the negative long run stock price performance is not consistent across all markets or even within a single market. The evidence of long run performance is controversial, with different researchers reporting contrasting results. As noted by Loughran and Ritter (1995) and Eckbo *et al.* (2000), among others, the results of long run performance studies may differ as a result of variations in the methods used to measure abnormal returns.

In investigating whether the involvement of venture capitalists affects the long run performance of IPOs, Brav and Gompers (1997) examine the effects of using different benchmarks and methods to measure long run performance of 934 venture-backed IPOs and 3,407 nonventure-backed IPOs in the US. Using equally-weighted returns, they find that venture-backed IPOs *over*perform nonventure-backed IPOs over a five-year period. They also find that a value-weighting return significantly reduces underperformance relative to the benchmarks. They report that underperformance of nonventure-backed IPOs is concentrated in small companies. However, when the Fama and French (1993) three-factor model is adopted, the underperformance of small nonventure-backed companies cannot be explained by this model. Brav and Gompers (1997) find that equity issuers' return patterns are not a unique anomaly. The performance of the IPO issuer is similar to the non-issuer matched by size and the book-to-market ratio. This indicates that underperformance is a characteristic of small companies with low book-to-market ratio, irrespective of whether they are IPO companies or non-IPO companies.

Brav (2000) illustrates the use of the methodology by examining the long run returns of IPOs. Brav (2000) finds results that are inconsistent with the Fama and French (1993) three-factor model. Brav (2000) comments that the standard assumptions that abnormal returns are independent and normally distributed fail to hold over long horizons. According to Brav (2000), this is due to many of the sample companies overlapping in calendar time and long-horizon returns being skewed to the right by the compounding of single-period returns.

In a more recent study on the US market, Gompers and Lerner (2003) investigate 3,661 US IPOs from 1935 to 1972 for holding periods up to five years after listing. Their findings demonstrate that the IPOs' performance depends on the method used to measure returns. Their results show some evidence of underperformance when value-weighted event-time buy-and-hold abnormal returns are used. However, the underperformance disappears when either equally-weighted event-time buy-and-hold or cumulative abnormal returns are employed. IPOs returns are quite similar to the market when calendar-time analysis is undertaken. On the other hand, the results they derive from the CAPM and the Fama and French three-factor regressions suggest no abnormal performance.

Espenlaub *et al.* (2000) provide further evidence on the sensitivity of long run performance to the choice of empirical method. In examining a new data set of 588 IPO companies in the UK over the period from 1985 to 1992, they re-examine the evidence of long run returns over a five-year period by comparing abnormal performance based on five alternative benchmarks under an event-time approach and a calendar-time approach. The alternative benchmarks are the basic Capital Asset Pricing Model (CAPM), the simple size-adjusted model of Dimson and Marsh (1986), a multi-index

model using the return on the HGSCI minus the return on the FTASI, the Fama and French (1996) three-factor model, and the Returns Across Securities and Times (RATS) model of Ibbotson (1975). They find substantial negative abnormal returns three years after the offerings, irrespective of the benchmark employed in their event-time approach. However, over a five-year period the underperformance is less dramatic and depends upon the benchmark applied. Their findings support Ritter's (1991) argument that the long run performance of IPOs is sensitive to the benchmark used.

Unlike those documented in previous international evidence, the results of Kim, Krinsky and Lee (1995) reveal that 169 companies listed on the Korean Stock Exchange during the period 1985 to 1989 *over*perform seasoned companies with similar characteristics. They suggest that their study does not support the existing theories of divergence of opinion (Miller, 1977), and fads (Aggarwal and Rivoli, 1990) on the long run performance. A positive long run performance is also observed by Lee *et al.* (1996a), Allen *et al.* (1999) and Durukan (2002) for IPOs in Singapore, Thailand and Turkey, respectively.

There has been conflicting evidence regarding post-offering performance of IPOs in Australia from Lee *et al.* (1996b) and Da Silva Rosa, Velayuthen and Walter (2003). Lee *et al.* (1996b) find that Australian IPOs exhibit severe underperformance in the three-year post-IPO period whereas Da Silva Rosa *et al.* (2003) find no evidence of underperformance in the two-year post-IPO period in the same market.

Table 4.2 summarises selected empirical studies of IPO long run stock price performance in different countries, excluding Malaysia, since the early 1990s. In summary, the general weight of evidence finds negative long run performance across

many markets internationally. However, there are also some instances of positive long run performance, mainly seen in recent evidence from both developed and developing markets. In particular, results appear to be sensitive to the methods used to measure long run share price performance.

Table 4.2 A summary of selected non-Malaysian published empirical studies on the long run stock returns from IPOs, employing event-time and calendar-time approaches

Country examined	Study/Publication date/Sample size/Sample period	Performance window*	Approach	Benchmark	Main stock market performance measure^	Findings#
Australia	Lee *et al.* (1996b) 266 1976-1989	3	Event-time	Market index	*BHAR*	IPO companies significantly underperform the market in the long run.
Australia	Da Siva Rosa *et al.* (2003) 333 IPOs 1991-1999	2	Event-time	Market index Market-value quintiles Book-to-market quintiles	*BHAR* *WR*	IPO companies do not underperform in the long run using both approaches. IPO companies significantly *over*perform when market-value and book-to-market quintiles are used as a benchmark under event-time approach.
			Calendar-time	Size and book-to-market portfolio	*FF3F*	
Brazil	Aggarwal *et al.* (1993) 62 IPOs 1980-1990	3	Event-time	Market index	*BHAR* *WR*	IPO companies significantly underperform the market in the long run.
Canada	Kooli and Suret (2004) 445 IPOs 1991-1998	5	Event-time	Size-matched company	*CAR* *BHAR*	IPO companies *in*significantly underperform in the long run using event-time *CAR* and *BHAR*.
Chile	Aggarwal *et al.* (1993) 1982-1990 36 IPOs	3	Event-time	Market index	*BHAR* *WR*	IPO companies *in*significantly underperform the market in the long run.
Finland	Keloharju (1993) 79 IPOs 1984-1989	3	Event-time	Market indexes (EW/VW)	*CAR* *BHAR* *WR*	IPO companies significantly underperform all the market benchmarks.
Germany	Ljungqvist (1997) 145 IPOs 1970-1990	3	Event-time	Market index	*BHAR*	IPO companies significantly underperform the market in the long run.
Germany	Stehle *et al.* (2000) 187 IPOs 1960-1992	3	Event-time	Market index Size portfolio Size-matched company	*BHAR* *WR*	IPO companies *in*significantly underperform all the benchmarks in the long run.

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Table 4.2 ***(continued)*** **A summary of selected non-Malaysian published empirical studies on the long run stock returns from IPOs, employing event-time and calendar-time approaches**

Country examined	Study/Publication date/Sample size/Sample period	Performance window*	Approach	Benchmark	Main stock market performance measure^	Findings#
Japan	Hwang and Jayaraman (1995) 182 IPOs 1975-1989	3	Event-time	Market indexes Industry Industry and size-matched company	*CAR*	Mixed results are found. IPO companies *in*significantly *over*perform the matching companies, significantly *over*perform the TSE value-weighted and significantly underperform the TSE equally-weighted.
Japan	Cai and Wei (1997) 180 IPOs 1971-1992	5	Event-time	Market indexes (EW/VW) Industry portfolios (EW/VW) Size-matched portfolios Market-to-book ratios Size and market-to-book matched Book-assets and industry matched	*BHAR* *WR*	IPO companies significantly underperform relative to a number of benchmarks (six out of eight).
Korea	Kim *et al.* (1995) 99 IPOs 1985-1988	3	Event-time	Market index Industry and size-matched company Industry index	*BHAR* *WR*	IPO companies significantly *over*perform all the benchmarks.
Mexico	Aggarwal *et al.* (1993) 1987-1990 44 IPOs	1	Event-time	Market index	*BHAR* *WR*	IPO companies *in*significantly underperform the market in the long run.
New Zealand	Firth (1997) 143 IPOs 1979-1987	5	Event-time	Industry and size-matched company	*CAR* *BHAR* *WR*	IPO companies significantly underperform the matching companies in the long run.
Singapore	Lee *et al.* (1996a) 132 IPOs 1973-1992	3	Event-time	Market index	*WR*	IPO companies *in*significantly *over*perform in the long run.

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Table 4.2 ***(continued)*** **A summary of selected non-Malaysian published empirical studies on the long run stock returns from IPOs, employing event-time and calendar-time approaches**

Country examined	Study/Publication date/Sample size/Sample period	Performance window*	Approach	Benchmark	Main stock market performance measure^	Findings#
South Africa	Page and Reyneke (1997) 118 IPOs 1980-1991	4	Event-time	Sector indices Size and P/E ratio-matched company	*CAR* *BHAR* *WR*	IPO companies significantly underperform all the benchmarks in the long run.
Spain	Alvarez and Gonzalez (2005) 34 IPOs 1987-1997	5	Event-time	Market indexes Size portfolio Book-to-market ratio portfolio Size and book-to-market ratio portfolio Size and book-to-market ratio-matched company	*BHAR* *WR*	IPO companies *in*significantly underperform all benchmarks in the long run.
Taiwan	Huang (1999) 311 IPOs 1971-1995	4	Event-time	Market index	*CAR*	IPO companies *in*significantly underperform the market in the long run.
Thailand	Allen *et al.* (1999) 151 IPOs 1985-1992	3	Event-time	Market indexes	*CAR*	IPO companies *in*significantly *over*perform the market benchmarks.
Tunisia	Naceur and Ghanem (2001) 16 IPOs 1990-1999	3	Event-time	Market index	*BHAR*	IPO companies *in*significantly underperform the market in the long run.
Turkey	Durukan (2002) 173 IPOs 1990-1997	3	Event-time	Market index	*BHAR*	No evidence of long run underperformance. IPO companies *in*significantly *over*perform the market benchmark.

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Table 4.2 ***(continued)*** **A summary of selected non-Malaysian published empirical studies on the long run stock returns from IPOs, employing event-time and calendar-time approaches**

Country examined	Study/Publication date/Sample size/Sample period	Performance window*	Approach	Benchmark	Main stock market performance measure^	Findings#
United Kingdom	Levis (1993) 712 IPOs 1980-1988	3	Event-time	Market indexes	*CAR* *BHAR* *WR*	IPO companies significantly underperform all the market benchmarks.
United Kingdom	Khurshed *et al.* (1999) 240 IPOs 1991-1995	3	Event-time	Market index	*BHAR* *CAR*	IPO companies significantly underperfom the market in the long run.
United Kingdom	Espenlaub *et al.* (2000) 588 IPOs 1985-1992	5	Event-time	CAPM Size-decile control portfolio Multi index model *FF3F* (1996) RATs	*CAR*	IPO companies significantly underperform four of the benchmarks under the event-time approach, but *in*significantly underperform under the calendar-time approach.
			Calendar-time	Size and book-to-market portfolio	*FF3F*	
United States	Ritter (1991) 1,526 IPOs 1975-1984	3	Event-time	Market indexes Industry and size-matched company Small company index	*CAR* *BHAR* *WR*	IPO companies significantly underperform all benchmarks in the long run.
United States	Loughran (1993) 3,656 IPOs 1967-1987	6	Event-time	Market index	*CAR* *BHAR* *WR*	IPO companies significantly underperform the market in the long run.
United States	Loughran and Ritter (1995) 4,753 IPOs 1970-1990	5	Event-time	Market indexes Size-matched company	*BHAR* *WR*	IPO companies significantly underperform in the long run using both approaches.
			Calendar-time	Size and book-to-market portfolio	*FF3F*	

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Table 4.2 ***(continued)*** **A summary of selected non-Malaysian published empirical studies on the long run stock returns from IPOs, employing event-time and calendar-time approaches**

Country examined	Study/Publication date/Sample size/Sample period	Performance window*	Approach	Benchmark	Main stock market performance measure^	Findings#
United States	Brav and Gompers (1997) 4,341 IPOs 1975-1992	5	Event-time	Market indexes	*BHAR* *WR*	IPO companies *in*significantly underperform using event-time approach but *in*significantly *over*perform using calendar-time approach.
			Calendar-time	Industry portfolio Size and book-to-market portfolio	*FF3F*	
United States	Carter *et al.* (1998) 2,292 IPOs 1979-1991	3	Event-time	Market index	*BHAR*	IPO companies significantly underperform the market in the long run.
United States	Gompers and Lerner (2003) 3,661 IPOs 1935-1972	5	Event-time	Market index Size and book-to-market portfolio	*BHAR* *CAR*	Some underperformance when event-time *BHAR* is used but no underperformance when *CAR* is employed.
			Calendar-time	Size and book-to-market portfolio	*FF3F*	The intercept in *FF3F* is insignificant.

Note:

* 'Window' is the number of years over which aftermarket returns are computed. It may be after issuance or listing.

^ The main stock market performance measure include *CAR* (Cumulative abnormal return), *BHAR* (Buy-and-hold abnormal return), *WR* (Wealth relative), and *FF3F* (Fama-French three-factor model). Several studies (e.g., Espenlaub *et al.*, 2000; Gompers and Lerner, 2003) also employed other model such as the *CAPM* (Capital Asset Pricing Model) when using the calendar-time approach.

The results are based on the main stock market performance measure stated.

4.2.2.2 Malaysian studies

A limited number of studies on the long run performance of IPOs have been carried out in Malaysia, including Wu (1993), Mohamad *et al.* (1994), Paudyal *et al.* (1998), Jelic *et al.* (2001), and Corhay *et al.* (2002). In contrast to studies in the UK and the US, an early study by Wu (1993), from 1974 to 1989, using 70 IPOs listed on the Main Board of KLSE, reports positive aftermarket performance. He shows that there is a positive trend in the average adjusted monthly returns in the first 11 months, with a *CAR* of 12.3%, and a negative trend in average adjusted monthly returns thereafter, which reduced the *CAR* to 3.7% in month 36. On the other hand, his adjusted buy-and-hold returns show that the abnormal returns of the IPOs relative to the market diminish in the two- and three-year periods, even though they are still positive. However, Wu (1993) ignores the effect of compounding when calculating the long run holding period returns. Mohamad *et al.* (1994) also find significant positive abnormal returns in the three-year period.

Paudyal *et al.* (1998) examine the long run performance of 95 Malaysian IPOs listed on the Main Board of the KLSE during the period 1984 to 1995, using KL Composite Index (KLCI) as a market benchmark. They find that the performance of their sample of IPO companies is not different from the performance of market portfolios with buy-and-hold abnormal returns of 9% in 36 months. The reputation of the underwriters has a significant positive relationship with the long run performance of IPOs. A study by Jelic *et al.* (2001) uses a larger sample (182 IPOs) and longer sample period (1980-1995) than Paudyal *et al.* (1998) but still examines those IPOs listed on the same board of listing. Instead of focusing on the methodological issues on the measurement of long run share price performance, its centre of attention is on the role of management

earnings forecasts and underwriters in the valuation of IPOs. Surprisingly, Jelic *et al.* (2001) find evidence contrary to that of Loughran and Ritter (1995) for long run returns, where positive and statistically significant long run returns for up to three years after listing are found in Malaysia. They report that the *CAR* for month 36, subsequent to the initial offering, is significantly positive at 24.8%. Consistent with the *CAR* estimation, buy-and-hold returns adjusted for the KLCI are also positive and statistically significant for month 36 at 22.0%.

Corhay *et al.* (2002) investigate the existence of the growth-value effect by examining 258 Malaysian IPOs listed on both the Main Board and Second Board of the KLSE during the period 1992 to 1996. Using three growth-value proxies (book-to-market equity ratio (B/M), earnings-to-price ratio (E/P) and cash flows-to-price ratio (C/P)), they report that growth IPOs stock underperform value IPOs stock. However, both types of IPOs generate higher returns than the market. Based on their regression analysis, B/M, E/P and C/P are found to have a positive but insignificant relationship with *CAR*. Contrary to the general empirical findings in other countries, they find that IPOs tend to *over*perform the market with a positive *CAR* of 41.7% over the three years subsequent to listing.

Table 4.3 summarises the results of empirical studies of long run IPO stock price performance for the Malaysian market. In summary, Malaysian IPO studies have typically used relatively small samples (e.g., Wu, 1993; Mohamad *et al.* 1994) or have examined only the companies listed on the Main Board of the KLSE (e.g., Wu, 1993; Mohamad *et al.*, 1994; Paudyal *et al.*, 1998; Jelic *et al.*, 2001). All the studies on the Malaysian market employ the event-time approach and do not address the methodological issues concerning the measurement of the long run share returns. Given

that only the event-time approach has been used to estimate long run performance in previous Malaysian IPO studies, it is not clear whether Malaysian IPOs produce significantly higher positive long run returns as compared to the results observed in developed markets that generally report underperformance. The results obtained from prior studies of Malaysian IPOs are open to question due to the fact that the measurement of long run returns is problematic and sensitive to the model of expected returns and the method employed to calculate the long run returns. This is due to the fact that the asset pricing models applied to predict expected returns may be insufficient to adjust for risk, and the method employed to calculate the long run share price performance is exposed to various statistical biases.

Table 4.3 A summary of Malaysian published empirical studies on the long run stock returns from IPOs

Study/Publication date/Sample size/Sample period	Performance window*	Approach	Benchmark	Main stock market performance measure^	Findings#
Wu (1993) 70 IPOs (Main Board) 1974-1989	3	Event-time	Market index (Sectoral Indices)	*CAR* *BHAR*	IPO companies significantly *over*perform the market benchmark using *CAR* but *in*significantly *over*perform using *BHAR*.
Mohamad *et al.* (1994) 65 IPOs (Main Board) 1975-1990	3	Event-time	Market index (KL Composite Index)	*CAR*	IPO companies significantly *over*perform the market benchmark.
Paudyal *et al.* (1998) 95 IPOs (Main Board) 1984-1995	3	Event time	Market index (KL Composite Index)	*BHAR*	IPO companies *in*significantly *over*perfom the market benchmark.
Jelic *et al.* (2001) 182 IPOs (Main Board) 1980-1995	3	Event-time	Market index (KL Composite Index) Industry and size-matched company	*CAR* *BHAR* *WR*	IPO companies significantly *over*perform the market benchmark but *in*significantly underperform the matching companies.
Corhay *et al.* (2002) 258 IPOs (Main and Second Board) 1992-1996	3	Event-time	Market index (KL Composite Index)	*CAR* *BHR* *WR*	IPO companies significantly *over*perform the market benchmark.

* 'Window' is the number of years over which aftermarket returns are computed. It may be after issuance or listing.

^ The main stock market performance measure include *CAR* (Cumulative abnormal return), *BHAR* (Buy-and-hold abnormal return), and *WR* (Wealth relative).

The results are based on the main stock market performance measure stated.

4.3 Prior studies of privatisation IPOs (PIPOs)

Megginson and Netter (2001) survey the empirical studies of privatisation to identify whether domestic and international investors who purchase PIPO shares experience positive initial and long run returns. They argue that examining the PIPOs is of interest since the offering terms and size are relatively larger than private IPOs. They note that share offerings are the best method used by the government to privatise the state-owned companies to achieve its political objective. Other reasons for PIPOs, as stated by them, are to: (i) raise revenue for the state; (ii) promote economic efficiency; (iii) reduce government interference in the economy; (iv) promote wider share ownership; (v) provide the opportunity to introduce competition; (vi) subject state-owned companies to market discipline; and (vii) develop the national capital market (p. 324).

4.3.1 Initial return performance

Several studies have empirically examined the initial return of previously state-owned companies from single countries; including Levis (1993), Menyah, Paudyal and Inyangete (1995) for the UK market, Paudyal *et al.* (1998) for the Malaysian market, Su and Fleisher (1999) and Chen, Firth and Kim (2004) for the Chinese market. A few studies examine the multi-country PIPOs' initial returns, including Perotti and Guney (1993), Dewenter and Malatesta (1997), and Jones, Megginson, Nash and Netter (1999). The results of most of these studies are broadly similar, suggesting that PIPOs produce a higher level of underpricing than private IPOs.

In the UK, Levis (1993) examines the performance of privatisation IPOs and privately-owned company IPOs. Of the 712 IPOs examined by Levis (1973), 12 are

PIPOs. However, Levis (1993) does not really test or make a comparison between these types of offerings. Levis (1993) finds that average first day market-adjusted returns for 12 privatisation IPOs are 37.3%. Menyah *et al.* (1995) study subscriber returns[51] and issuer underpricing for 40 UK privatisation IPOs between 1981 and 1991. They report an average underpricing, which is measured relative to the total equity market value on the first day of trading, of 23.6%. Meanwhile, they find the average raw returns available to subscribers of privatisation IPO to be 41.4%. The average estimate is higher than earlier estimates by Levis (1993), who reports first day raw initial returns of 35.6%.

One study deals specifically with Malaysian PIPOs. In analysing the initial excess returns of 18 privatisation IPOs and 77 private sector IPOs in Malaysia during the period 1984 to 1995, Paudyal *et al.* (1998) estimate the initial returns offered by PIPOs and compare them with other IPOs. They find that Malaysian IPOs are underpriced with an initial raw return and initial excess return after adjustment for KLSE Composite Index of 61.8% and 62.1%, respectively. They also report that PIPOs offer significantly higher initial returns than other IPOs, with an average initial raw return of 104.7% and an initial market-adjusted return of 103.5%. These returns are much higher than the 35.6% and 41.4% for UK PIPOs reported by Levis (1993) and Menyah *et al.* (1995), respectively. However, Paudyal *et al.*'s (1998) findings are consistent with Perotti and Guney (1993), who find an average return of 99.6% for 13 Malaysian PIPOs. Paudyal

[51] They assume that the subscriber return is different from issuer underpricing. In their study, the estimate of subscriber returns assumes that: (i) the demand for IPO subscription is equal to the number of shares supplied; (ii) there is no time lag between the application closing day and the first day of trading; (iii) subscribers are allocated all the shares for which they applied; and (iv) the company sells all its shares to new investors. Meanwhile, the estimate of issuer underpricing is based upon the proportion of shares sold and the potential interest income associated with the fund received from share applicants (p. 480).

et al. (1998) examine the explanatory power of five variables: over-subscription, market volatility, the proportion of shares sold, underwriter reputation, and ex ante risk on initial premium using ordinary least square methods. These variables explain 78% of the variation in the excess returns offered by Malaysian PIPOs, 10% of private IPOs and 36% of the whole sample.

Malaysian PIPOs also feature in three multi-country studies, by Perotti and Guney (1993), Dewenter and Malatesta (1997), and Jones *et al.* (1999). Perotti and Guney (1993) collect the information available on the privatisation programmes of three developed countries, namely France, the UK, and Spain, and four developing countries, namely Nigeria, Chile, Turkey, and Malaysia. They report that there is higher underpricing in share issue privatisations in Malaysia, with market price increasing to an average premium approximately 80% from the offer price.

Dewenter and Malatesta (1997) compare the initial offer prices in the privatisation of state-owned and private companies. They investigate public offerings involving 109 stated-owned and privately-owned enterprises (38 in the UK, 13 in Canada, 10 in France, 10 in Hungary, 12 in Malaysia, 3 in Japan, 19 in Poland and 4 in Thailand) and find that initial returns are significantly higher in relatively primitive capital markets, as well as in privatised companies in regulated industries. They find average unadjusted one-day returns of 18% for the UK, 2.5% for Canada, 11.4% for France, 14.9% for Hungary, 52.2% for Malaysia, 16% for Japan, 50% for Poland and 46.6% for Thailand; the average market-adjusted one-day returns are also all positive. Based on their comparison between the initial returns of PIPOs and private IPOs, they conclude that their results provide little support for the view that all governments tend to underprice initial offerings to a greater degree than private company issuers. Jones *et al.* (1999),

who only focus on PIPOs (a sample of 630 companies) from 59 countries during the period 1977 to 1997, find that governments consistently underprice share issue privatisation offers, provide favourable share allocations to domestic investors, and typically use fixed price methods in setting the offer price.

In summary, the results suggest that PIPOs produce an even higher level of underpricing than private IPOs.

4.3.2 Long run share price performance

The relatively few studies that analyse the long run stock market performance of PIPOs in single countries include Levis (1993) and Menyah *et al.* (1995) for the UK market, and Paudyal *et al.* (1998) and Sun and Tong (2002) for the Malaysian market. Several studies examine the multi-country evidence on the long run returns to PIPOs, including Boubakri and Cosset (2000), Megginson, Nash, Netter and Schwartz (2000), and Comstock, Kish and Vasconcellos (2003). The results of most of these studies suggest that there is a positive long run performance across many markets, although there is a negative long run performance observed on the Malaysian market.

Among the earlier studies on the UK market, Levis (1993) finds an average of 96.9% for three-year holding period returns for 12 PIPOs, indicating that the UK privatisation IPOs have a superior performance relative to their benchmarks. However, he does not compare PIPO and private IPO performances. Menyah *et al.* (1995) compare the long run performance of PIPOs and private sector IPOs in the UK, and find that UK PIPOs, on average, are good long term investments when compared to their private sector counterparts.

Boubakri and Cosset (2000) examine the post-issue stock price performance of 120 PIPOs in 26 developing countries, covering the period from 1982 to 1995. They report that PIPOs produce economically and statistically significant positive raw returns and adjusted returns, matched by size and book-to-market. The results suggest that investors' expectations rise over the three years after the issue, even though at the beginning of the privatisation process they seem to be relatively pessimistic. Additionally, in examining the long run returns to investors in 158 PIPOs from 33 countries between 1981 and 1997, Megginson *et al.* (2000) find similar results.

Paudyal *et al.* (1998) also examine the long run performance of 18 Malaysian PIPOs and 77 private IPOs, using daily compounded return, and compare them with market returns proxied by the KLSE Composite Index. Further analysis of the long run performance is carried out, based on (i) PIPOs versus IPOs; (ii) low versus high initial return; and (iii) underwriter reputation. The average holding period market-adjusted excess return over 36 months is -7.46% for PIPOs and 12.85% for private IPOs. This indicates that investors buying PIPOs from the first day of trading and holding the portfolio up to three years would not, on average, receive any significant excess returns. However, the holding period return losses generated by PIPOs are not significant and neither PIPOs nor other IPOs significantly *over*perform/underperform the market over three years.

Another study on Malaysian PIPOs, undertaken by Sun and Tong (2002), uses a sample of only 24 PIPOs during the period 1983 to 1997. Like Paudyal *et al.* (1998), they find that PIPOs slightly underperform the benchmark, with an annual mean market-adjusted return of -3.3% in the fourth year after privatisation (significant at the 10% level). They argue that this might be due to benchmark errors.

In summary, the general weight of evidence finds positive long run performance across many markets but underperformance is also observed in several markets. For example, several studies (e.g., Menyah *et al.*, 1995) indicate that PIPOs are better long term investments than private IPOs. Surprisingly, the results observed for the Malaysian market show the reverse.

Table 4.4 summarises the empirical studies that examine solely privatisation IPOs and/or compare the private IPO and PIPOs performances from single countries.

Table 4.4 A summary of empirical studies examining the long run returns to investors in PIPOs from single countries

Country examined	Study/Publication date/Sample size/Sample period	Performance window*	Approach	Benchmark	Main stock market performance measure^	Findings#
UK	Levis (1993) 12 PIPOs 1980-1988	3	Event-time	Market indexes (FT All Share and Hoare Govett Small Company Indices)	*BHAR*	PIPOs significantly *over*perform all the market benchmarks.
UK	Menyah *et al.* (1995) 40 PIPOs 1981-1991	1	Event-time	Market index (FT All Share Index)	*BHAR*	Significant *over*performance for PIPOs but *in*significant *over*performance for private IPOs.
Malaysia	Paudyal *et al.* (1998) 77 private IPOs and 18 PIPOs (Main Board) 1984-1995	3	Event-time	Market index (KL Composite Index)	*BHAR*	*In*significant underperformance for PIPOs but *in*significant *over*performance for private IPOs.
Malaysia	Sun and Tong (2002) 24 PIPOs (Main Board) 1983-1997	5	Event-time	Market indexes (Equal-weighted and value-weighted KLCI indices) Industry indexes (Equal-weighted and value-weighted indices)	*BHAR*	Negative annual returns in the post-PIPOs but *in*significant in most cases.

Note:

* 'Window' is the number of years over which aftermarket returns are computed. It may be after issuance or listing.

^ The main stock market performance measure include *CAR* (Cumulative abnormal return), *BHAR* (Buy-and-hold abnormal return), and *WR* (Wealth relative).

The results are based on the main stock market performance measure stated.

4.3.3 Prior studies of seasoned equity offerings (SEOs)

While the main focus of the present study is to examine the share price performance of IPOs, for completeness this chapter also explores related evidence on the share price performance of companies making additional equity or seasoned equity offerings (SEOs). Studies of the long run performance of SEOs include Loughran and Ritter (1995), Spiess and Affleck-Graves (1995), Cai and Loughran (1998), Eckbo *et al.* (2000), Brav, Geczy and Gompers (2000), Mathew (2002), and Clarke, Dunbar and Kahle (2004).

For the US, Loughran and Ritter (1995) find that SEO companies, on average, underperform non-issuing companies by 33.0% and 59.4% for the three- and five-year periods after issuance. The geometric average raw returns for their sample of SEO companies are only 7.0% per year. On the other hand, the geometric average raw returns for their size-matched companies are 15.3% per year in the same length of period examined. This indicates that their sample of SEO companies underperform their size-matched companies by 8.3% per year. They find that the poor performance of their sample of SEO companies is not a result of long run return reversals and differences in beta. Moreover, they conclude that the underperformance persists across the sample period, offer size and age of the company. Similar to Ritter's (1991) conclusion, they support the 'windows of opportunity' hypothesis in which managers take advantage of company-specific information to issue equity when the company's stock is overvalued. Similar results are observed by Spiess and Affleck-Graves (1995), and Clarke *et al.* (2004) for the US SEOs. Cai and Loughran (1998) examine Japanese SEOs between 1971 to 1992 and obtain similar results.

By using a sample of more than 7,000 seasoned equity and debt offerings during the period 1964 to 1995, Eckbo *et al.* (2000) examine the risk characteristics of the return differential between a portfolio of issuing and non-issuing companies matched by size and the book-to-market ratio. They conclude that the 'new issue puzzle' is explained by a failure of the matched-company technique to provide a proper control for risk.

Brav *et al.* (2000) analyse the existence of the underperformance anomaly to equity issuer. By using a sample of 4,622 IPOs and 4,526 SEOs between 1975 to 1992, they find that underperformance is concentrated primarily in small issuing companies with low book-to-market ratios. Brav *et al.* (2000) argue that poor long run stock returns following equity issues are not unique. They observe that the returns to the IPO issuer are similar to the non-issuer, matched on company size and book-to-market ratio. However, there is some underperformance in returns to SEOs issuers relative to various benchmarks. Furthermore, they report that the level of underperformance of IPOs and SEOs tends to magnify when buy-and-hold returns are used to calculate abnormal performance.

Mathew (2002) examines 744 Japanese SEOs between 1975 and 1992, 415 Korean SEOs between 1979 and 1992, and 313 Hong Kong SEOs between 1982 and 1992. Consistent with the results of previous studies, Mathew (2002) observes that SEO companies in unrestricted markets[52] such as Japan and Hong Kong perform poorly in the 36-month period subsequent to the issue. The results support the hypothesis that

[52] Mathew (2002) characterises the Hong Kong market as one with few regulations. The Japanese regulatory structure is similar to that of the US in which issuing companies are allowed to set the timing and price of an offering with no restrictions.

managers do take advantage of private information when issuing SEOs. This finding also supports Ritter's (1991) hypothesis whereby companies take advantage of periods in which investors are overly optimistic about the value of the stock. However, insignificant negative abnormal returns are found in Korea that have some form of regulatory or organisational restrictions. Mathew (2002) suggests that the insignificant results observed in the Korean market is due to the restrictions placed on management from raising capital in the debt market as well as set guidelines for the pricing of the equity offerings in which the available discount is reduced from market price from 50% in 1984 to 10% in 1988. Mathew (2002) implies that an equity issue in Korea is therefore more likely to be an indication of future prospects rather than an attempt by management to take advantage of an overvalued market price.

Overall, it would appear that no studies have been undertaken to examine the long run performance of SEOs for the Malaysian market. From the review, on average, companies issuing SEOs also experience negative abnormal returns similar to companies making IPOs.

4.4 Research questions

The research examining the stock market performance on IPOs in general reveals that these investments tend to underperform their benchmarks, either within the market as a whole, or compared to a size-matched company. However, there is a debate in the IPO literature on the methodological issues surrounding the estimation of long run stock market performance, which centres on how to calculate the long run returns, the benchmark used, and how to construct test statistics. The methodological problems that exist to estimate the long run returns have not been resolved in all markets and the

significant *over*performance observed for Malaysian IPOs in general is not very convincing without further robustness testing. Therefore, the present study re-examines the robustness of the previous findings on the long run share price performance of Malaysian IPOs by using several methods to measure returns, different market benchmarks to adjust the returns, and appropriate statistical tests. The variety of methods will enable a view to be formed as to whether the findings of the present study are sensitive to the model and method employed.

Based on the review of prior literature, the following broad research question is identified:

1. *'How do Malaysian IPO companies perform relative to several benchmarks in the long run?'*

If so,

2. *'Do both event-time and calendar-time approaches produce the same results?'*

In order to test this broad research question, several hypotheses are outlined in the following section.

4.5 Formal hypotheses

Various methods of measuring abnormal performance have been discussed in the literature (e.g., Barber and Lyon, 1997; Kothari and Warner, 1997; Lyon *et al.*, 1999). As noted by Loughran and Ritter (1995), Eckbo *et al.* (2000) and Gompers and Lerner (2003), among others, the results of long run performance studies may vary as a result

of differences in the methods used to measure abnormal returns. For example, Gompers and Lerner's (2003) findings demonstrate that IPO performance depends on the method used to measure returns. Their results show some evidence of underperformance when value-weighted event-time buy-and-hold abnormal returns are used. However, the underperformance disappears when either equally-weighted event-time buy-and-hold or cumulative abnormal returns are employed. On the other hand, the results they derive from the calendar-time approach, such as the Fama-French three-factor model, suggest that there is no abnormal performance. It is clear that one possible explanation for the mixed results on the long run abnormal returns is caused by methodological errors in the identification of long run returns.

Barber and Lyon (1997) and Kothari and Warner (1997) find that long-horizon test statistics are misspecified. They indicate that the direction and magnitude of bias in long horizon studies can be sensitive to sample characteristics such as the book-to-market ratio, size, exchange listing, and the time period studied. Parametric test statistics are found to be subject to misspecification because they do not satisfy the assumptions of zero mean and unit normality. They recommend nonparametric or bootstrap procedures as a means of reducing misspecification.

The cross-sectional and time-series pattern of long run IPO performance has been examined by several researchers. For example, Loughran and Ritter (1995) report that the degree of underperformance by issuing companies fluctuates over time. They find that IPOs that occur in years when there is little issuing activity exhibit no statistically significant underperformance, whereas companies selling stock during high volume periods severely underperform. In their analysis of Japanese IPOs, Hwang and Jayaraman (1995) observe no differences in abnormal returns across industries for their

IPO and non-IPO groups. However, Cai and Wei (1997) note that Japanese issuing companies underperform size-matched non-issuing companies in most industries. Ritter (1991) finds that US IPOs display long run underperformance, with a tendency for the smaller offers to have the worst aftermarket performance. He also reports that companies which have the highest mean initial returns also have the poorest long run returns, consistent with the 'fad' hypothesis of Aggarwal and Rivoli (1990) and the 'overreaction' hypothesis of De Bondt and Thaler (1985, 1987). Levis (1993) and Menyah *et al.* (1995) find that UK PIPOs are a superior long term investment. Page and Reyneke (1997), and Khurshed *et al.* (1999) conclude that the degree of underperformance is greater among smaller companies.

Based on the above evidence, the hypotheses of the present study are as follows:

H1: There is a difference in the long run performance when the market indexes and size-matched company are used as a benchmark.

H2: There is a difference in the long run performance when the event-time and calendar-time approaches are employed.

H3: There is a difference in the level of significance of the long run buy-and-hold abnormal returns when the bootstrapped skewness-adjusted t-statistic is calculated.

H4: There is a difference in mean buy-and-hold abnormal returns when the sample is categorised by year of listing, sector, board of listing, size, type of company - private or privatisation, gross proceeds, and initial returns.

4.6 Summary

This chapter reviews the empirical evidence of IPO stock market performance. The results of market-based evidence in developed and developing countries indicate that, on average, investors who purchase the IPO at the offer price receive higher first day returns. Studies undertaken in Malaysia also show higher initial returns than those in the US and the UK. In examining post IPO stock market performance, the evidence generally suggests that there is negative long run performance across many markets. However, there is also evidence of positive long run performance in the Malaysian market and in recent studies of both developed and developing markets. Specifically, the results appear to be sensitive to the methods used to measure long run returns. From the review, it is apparent that market-based studies have not been able to answer the question of whether or not purchasing IPO shares is a good investment in the long run, or whether performance is a result of poor benchmarks used to measure returns. These findings have led to the specific hypotheses relating to stock market performance for testing on the Malaysian market in this thesis.

The next chapter describes the research design employed to investigate the stock market performance of Malaysian IPOs.

Chapter 5

Research design to investigate stock market performance

5.1 Introduction

Following the review of the literature and the hypotheses developed in Chapter 4, this chapter discusses the research design employed in the current study to examine the share price performance of Malaysian IPOs in general, and the long run performance in particular. Section 5.2 describes the sources of data for individual companies' returns and market returns. This is followed by an explanation of the process of data collection and the sample selection in Section 5.3. The selection criteria for the sample and for size-matched companies, together with market benchmarks, are also described. Section 5.4 discusses the methods adopted to measure the share price performance together with the statistical tests employed to evaluate the significance level of the initial and long run returns. Section 5.5 describes the variables used to assess the cross-sectional pattern of long run stock market performance. The final section concludes the present chapter.

5.2 Data sources on stock market performance

The current study examines Kuala Lumpur Stock Exchange (KLSE) companies from 1 January 1990 to 31 December 2000 inclusive, in order to identify Malaysian IPOs and to examine their short and long run share price performances. Companies that were included in the sample must be incorporated in Malaysia. The present study focuses only on new issues involving ordinary shares, which excludes preferred shares, debentures or loan stocks. The main justification for using a sample of listed IPOs from 1990 to 2000 is that there were fewer studies over this period, particularly from the

period 1996 onwards. Prior published studies on IPO long run share price performance in Malaysia have examined the period up to 1996 (e.g., Wu, 1993; Paudyal *et al.,* 1998; Jelic *et al.,* 2001; Corhay *et al.*, 2002). Another reason is that more information and databases concerning IPOs have become available since 1990. The present study utilises a more recent sample to obtain further evidence, particularly on the long run performance of IPOs in Malaysia. The sample period examined is up to 2000 since this study examines one- to three-year post IPO performance. The need to study long run post-IPO performance for three years after the offer requires that the sample period ends in 2000. Therefore, the period used in the present study is from 1990 through 2003. The number of newly listed companies on the KLSE between 1990 and 2000 is 543, of which 537 made IPOs of equity.

The identities of IPO companies subsequently listed on the KLSE during the period 1990 to 2000 were obtained from several sources. Prior to 1998, the source of data was the *'Listing'* section of the *Investors Digest*,[53] a monthly publication of the KLSE. The data was hand-collected from the January issue of this publication, which summarises IPO activity for the previous year. This publication provides details of each company such as date of listing, subscription price, the number of shares offered, the gross proceeds received, the types of IPOs, and the board of listing. The data for year 1998 onwards was downloaded from the KLSE website at http://www.klse.com.my/website/ipo.htm on 27 April, 2003. Additional information on IPOs was obtained from the main KLSE website located at http://www.klse.com.my.[54]

[53] *Investors Digest* comprises commentaries on the securities markets and economy of Malaysia.

[54] With effect from 1 May 2004, the website was changed to http://www.bursamalaysia.com.

Further data was obtained from another secondary source, the KLSE Research Institute of Investment Analysts of Malaysia Information System, located at http://www.klse-ris.com.my.

5.2.1 Individual company stock returns

The share price data for each IPO and non-IPO company were collected from the Datastream database. Specifically, the data comprised individual IPO closing prices on the first day of listing and the 36 monthly stock returns following listing. The total return index (RI) was used as the measure of monthly returns. It *'shows a theoretical growth in value of a share holding over a specified period, assuming that dividends are re-invested to purchase additional units of an equity at the closing price applicable on the ex-dividend date. Gross dividends are used where available and the calculation ignores tax and re-investment charges. Adjusted closing prices are used throughout to determine price index and hence return index'* (Datastream database definition). The monthly stock returns for each IPO company were then compared with the monthly stock returns of a matched company or market index on a rolling basis for each of the 36 months following the initial listing. Non-IPO companies listed on the KLSE were used to provide benchmarks for IPO companies. The procedure for selecting size-matched companies is discussed in Section 5.3.2.2. Matched companies were required to have a complete returns history over the corresponding time windows under consideration.

5.2.2 Market returns

Data on monthly market returns were also obtained from the Datastream database in order to provide market benchmarks. As pointed out by Ritter (1991), alternative benchmark portfolios were used in order to find out whether measurement problems could account for the poor long run performance. Ritter (1991) states that, '*...it is not clear at all what constitutes the appropriate benchmark portfolio*' (p. 12). Therefore, this study utilised three market benchmarks: (i) the KL Composite Index (KLCI); (ii) the EMAS Index (Exchange Main Board All-Share Index); and (iii) the KLSE Second Board Index. Returns on the KL Composite Index (KLCI), the main market index in Malaysia, were collected to provide a benchmark for the overall sample. The KLCI comprises the 100 largest stocks and is weighted by market capitalisation.

As the samples of IPOs in the current study were listed on two boards, a benchmark appropriate to each board was used. The EMAS Index was used to provide a benchmark for IPO companies listed on the Main Board of the KLSE. The EMAS Index comprises all stocks quoted on the Main Board of the KLSE. Meanwhile, the Second Board Index was adopted for companies listed on the Second Board of the KLSE. The Second Board Index comprises all stocks quoted on the Second Board of the KLSE. Both the EMAS Index and the Second Board Index are weighted by market capitalisation. As of 20 July 2004, there were 613 and 279 companies listed on the EMAS Index and Second Board Index, respectively. The returns of sample companies from the Main (Second) Board were compared to the EMAS (Second Board) Index returns.

5.3 Sample selection

This section discusses the process of data collection by describing the criteria used to select the IPO companies and their matched companies.

5.3.1 Process of data collection

The first step undertaken in the process of data collection was to obtain the lists of companies that made an IPO and subsequently listed on the KLSE during the period 1990 to 2000. The lists of IPO companies were obtained from *'Public Issue'* and *'Offer for Sale'* subsections of the *Investors Digest*, as mentioned in Section 5.2.[55] These were then checked with the *'New Companies Listed on the KLSE'* subsection in order to confirm that the IPO companies were subsequently listed on the exchange.

Next, the lists of companies were cross-checked with the listing statistics available at http://www.klse.com.my/website/listing/listingstats.htm on 28 April, 2003. In order to collect the data for individual companies, the possibility of a change of a company's name was first checked. This was necessary as several companies have changed their name a number of times and the previous names did not appear in Datastream. The lists of changes of companies' names from 1995 onwards were available from http://www.klse.com.my/website/listing/lcprofs.htm. Changes of companies' names

[55] As explained in Chapter 2, there are three types of IPOs in Malaysia, namely public offers, offers for sale, and a combination of public offers and offers for sale (mixed offering). A public offer is a type of IPO, which is offered for subscription to the public for the first time. It will result in an increase in the paid-up capital of the company. Meanwhile, an offer for sale is a type of IPO in which shares have already been issued to original stockholders, who then offer their shares for sale to the public. In this situation, the paid-up capital of the company does not change because the money received from the sale of the stock does not go to the company.

prior to 1995 were traced by downloading the individual company's profile from the same website. Profiles of the companies were also obtained from the *Company database* available at http://www.klse-ris.com.my/html-dir/intro1.html. As of 30 April 2003, this database provided information on individual companies since 1990. The lists of companies were then matched with the companies together with the code available from Datastream in order to collect the data on share price performance.

5.3.2 Selecting IPO companies and matching companies

5.3.2.1 Selecting IPO companies

Several data conditions were imposed in the current study. Specifically, IPO companies had to satisfy the following criteria in order to remain in the final sample: (i) an offer price of RM1.00 per share or more; (ii) an offering involving common stock only,[56] and a requirement that the listing did not result from an introduction;[57] (iii) a fixed price offering, thereby excluding tender offers; (iv) the company to be listed on the Main Board or the Second Board of the KLSE; (v) the availability of returns data on the Datastream database for up to three years after listing; finally (vi) the exclusion of companies classified as Infrastructure Project Companies (IPCs), and companies from the Finance, Trust, or Closed-End Funds sector. The companies that were listed as Infrastructure Project Companies (IPCs) were excluded because they have high market capitalisation, which

[56] One company (Kedah Cement Holdings Bhd, listed on 29 January 1992), made a combined debt and common stock offering; this was excluded from the sample.

[57] Five companies issued shares and listed via introductions on 28 December 1990 (one company), 6 November 1991 (one company), 18 August 1997 (one company), and 15 December 1999 (two companies). The names of the companies are Amanah Harta Tanah PNB, Syarikat Kurnia Setia Bhd, KUB Malaysia Bhd, APM Automative Holdings Bhd and Warisan TC Holdings Bhd, respectively.

may unduly influence the results. Furthermore, they were new projects granted by the State to the private sector and therefore did not have the necessary track record. The companies that are listed under the Finance, Trust and Closed-End Funds sector were excluded because the data were not comparable with those of non-financial companies. They also have different statutory requirements in preparing companies' annual reports.

The final sample comprises 454 IPOs, of which 85 are public offers, 243 are offers for sale, and 126 are a combination of public offers and offers for sale (mixed offering). The sample of 454 IPOs comprises 91% of the potential number of IPOs available and covers 83.6% of newly listed companies during the period 1990 to 2000. Of the 454 IPOs, 435 are private IPOs and 19 are privatisation IPOs. The number of companies in the sample varies from year to year in accordance with the type of analysis undertaken and the time windows under consideration. Table 5.1 summarises the impact of data screening and the time distribution of the final sample.

5.3.2.2 Selecting matching companies

A control sample was created by matching each IPO company with a comparable company that did not make an IPO. The control group was used to provide information on how comparable companies, not involved in IPOs, differ from the test sample. The matching companies were chosen from KLSE-listed securities. Following Loughran and Ritter (1995), companies in the control sample were individually matched to companies in the IPO sample based on size, proxied by market capitalisation. In order to choose the matching company, on 31 December of each year (from 1990-2000), all KLSE common stocks listed on the Datastream database that had not made an IPO within the last three years were ranked by their market capitalisation. All companies for

their first three years after going public are excluded. A newly-listed company became eligible to be a matching company after any three-year period during which it has not issued equity. The company with the market capitalisation closest to, but higher than, that of the issuing company, was then chosen as the matching company. Due to a lack of available data on the book value of common equity for most Malaysian companies prior to 1993, it was not possible to match companies by the book-to-market ratio in the present study.

The next section discusses the methods used to measure the share price performance, the analysis undertaken, and the statistical tests employed to analyse the significance levels of long run returns.

Table 5.1 Impact of data screening and distribution of 454 IPOs listed during the period 1990 to 2000 by year

Steps of data collection by year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
Initial data on newly listed companies	31	39	45	44	66	51	92	88	28	21	38	543
Infrastructure Project Companies, Finance, Trust and Closed-End Funds sectors	4	8	6	1	2	2	9	7	0	0	0	39
New listings via *'introduction'* or companies making combination offerings	1	1	1	0	0	0	0	1	0	2	0	6
Potential numbers of IPOs available	26	30	38	43	64	49	83	80	28	19	38	498
Data on first day closing price and first month return index not available in Datastream database	0	3	4	6	10	8	7	3	1	0	2	44
Final sample (percentage sample selected) for share price performance analysis	**26** (100%)	**27** (90%)	**34** (89%)	**37** (86%)	**54** (84%)	**41** (84%)	**76** (92%)	**77** (96%)	**27** (96%)	**19** (100%)	**36** (95%)	**454** (91%)

5.4 Methods

To evaluate the investment performance of IPOs, the present study employs standard event study methodology, namely the event-time approach. Event-time returns are used instead of the calendar-time returns because calendar-time returns do not precisely measure investor experience (Barber and Lyon, 1997), are generally misspecified in random samples (Lyon *et al.*, 1999), and have low power (Loughran and Ritter, 2000). However, event-time returns suffer from a cross-sectional dependence problem (Fama, 1998; Mitchell and Stafford, 2000). As a robustness test, the present study also employed calendar-time returns.

In accordance with Ritter (1991), abnormal returns are calculated for two periods. The first of these is the initial return period, defined as the return obtained from purchasing the shares on the offering date, as disclosed in the prospectus, to the end of the first day of trading. The second period is the aftermarket or long run phase, defined as the three years (36 event months) *after* the first day of listing, excluding the initial return period. A three-year window is used to ease comparisons with other studies. Following Ritter (1991), the initial return period is defined to be month 0, and the aftermarket period includes the following 36 event months after listing. The event month is defined as the one-month period following the listing date. The method of calculating the initial and aftermarket returns, and the analysis undertaken together with the statistical test used are discussed next.

5.4.1 Measure of stock market performance, the analysis undertaken and test statistics used

5.4.1.1 Initial return

While the focus of the present study is to examine long run stock market performance, the initial return is also examined. The present study measures both the raw and market-adjusted initial returns. Raw initial return is calculated as:

$$R_{it} = (P_{it} - S_{io}) / S_{io} \qquad (5.1)$$

where:

R_{it} = *the initial return of company i 's share;*

P_{it} = *the closing price on the first day of listing;*

S_{io} = *the subscription price on the offering date.*

The abnormal initial return is the market-adjusted initial return *(MAIR)*, calculated as:

$$MAIR = R_{it} - R_{mt} \qquad (5.2)$$

where:

R_{mt} = *the return on the market portfolio proxied by the KL Composite Index, the main market index in Malaysia, calculated as:*

$$R_{mt} = (I_t - I_0) / I_0 \qquad (5.3)$$

where:

I_t *and* I_o = *the corresponding index levels.*

Both R_{it} and R_{mt} do not account for dividends as no dividend payments occurred in the short run. It is also assumed that beta is unity since there is no return history for IPOs to estimate systematic risk (Uhlir, 1989). Therefore, the Market Model and the Capital Asset Pricing Model are not employed in the current study.

To test whether the mean market-adjusted initial return equals zero, the associated *t*-statistic is calculated as follow:

$$t = (\overline{MAIR} * \sqrt{n}) / sd \qquad (5.4)$$

where:

sd = the standard deviation of $\overline{MAIR}$ *across the companies;*

n = the number of IPO companies in the sample.

5.4.1.2 Long run return

In order to identify abnormal stock returns for each IPO, 36 monthly returns were computed. In order to do so, 37 event return indices (RI) were obtained for each IPO following listing, along with size-matched companies and market indices. These returns excluded the initial returns by treating the RI on the first day of listing as a purchase price.[58] Following the argument of Loughran and Ritter (1995), investors frequently have difficulties in purchasing shares at the offering price due to over-subscription (Page and Reyneke, 1997). Therefore, they normally purchase shares in the aftermarket, in which the market price represents a price available to carry out a

[58] This return index is based on the first day closing price rather than the opening price, thus excluding the initial returns. A similar procedure is also employed by Firth (1997) and Page and Reyneke (1997), among others.

portfolio strategy. To evaluate the long run abnormal performance of IPOs, 36-month returns for both the IPOs and benchmarks were compared. Three benchmarks were employed: (i) a matching company approach (whereby a single IPO company is matched with a non-IPO company by market value); (ii) a reference portfolio consisting of the Malaysian main market index (the KL Composite Index); and (iii) a reference portfolio consisting of the alternative market indices in Malaysia (the EMAS/Second Board Index). The returns of sample companies from the Main Board were compared to the EMAS Index returns. In addition, the returns of sample companies from the Second Board were compared to the Second Board Index.

The present study uses three alternative measures to compute abnormal returns under the event-time approach and one measure under the calendar-time approach. For the event-time analysis three measures were used: (i) Cumulative mean abnormal return (*CAR*), calculated with monthly portfolio rebalancing, where the adjusted returns are computed using several different benchmarks identified earlier; (ii) Buy-and-hold abnormal returns (*BHAR*); and (iii) Wealth relative (*WR*), defined as the mean total return on IPOs divided by the mean total return on the benchmarks. For the calendar-time approach, the alpha value derived from the Fama-French (1993) three-factor model was used. Detailed measurement procedures are discussed next.

Event-time approach

There are several metrics used to measure long run abnormal stock market performance as reported by Barber and Lyon (1997), Kothari and Warner (1997) and Lyon *et al.* (1999). However, there is a consensus among all of these authors that no single method is dominant. Fama (1998), Mitchell and Stafford (2000), and Gompers and Lerner

(2003) argue that the *CAR* might be a better and less biased method for calculating long run returns. Even though the *CAR* still suffers from cross-sectional correlation, the effect of compounding a negative return, which may occur only in a single period, is eliminated. Furthermore, they argue that the distributional properties and the test statistics are better understood. As noted by Lyon *et al.* (1999), the *CAR* approach to measuring abnormal returns is warranted in order to answer the following question: *'Do sample [IPO companies] persistently earn abnormal monthly returns?'* (p. 192).

Barber and Lyon (1997) and Lyon *et al.* (1999) recommend applying the buy-and-hold abnormal return measure to evaluate long run performance, arguing that the use of 'independent' monthly rebalancing may introduce a downward bias in the long run *CAR*s. Buy-and-hold return measures may also reduce the statistical bias[59] in the measurement of cumulative performance (Conrad and Kaul, 1993). As noted by Lyon *et al.* (1999), the buy-and-hold return measure is warranted if researchers wish to discover whether or not IPO companies earned abnormal stock return over a specific horizon of analysis. Fama (1998) argues that buy-and-hold returns accurately measure the return to an investor who holds a security for a long post-event period by compounding short run returns to obtain long run returns. Due to the fact that both methods have pro and cons, the present study employed both approaches, to test the robustness of the results.

[59] For all k-period returns, the buy-and-hold return measure contains only a constant bias (the bias in the single period's return). However, in the cumulative *k*-period measure, *k* times the single-period return's bias may exist (Conrad and Kaul, 1993, p. 40).

(1) Cumulative mean abnormal returns (*CAR*s)

The monthly raw return for the event months is calculated as follows:

$$r_{it} = (P_{it} - P_{it-1}) / P_{it-1} \qquad (5.5)$$

where:

r_{it} = *raw return for company* i *in the event month* t *following listing;*

P_{it} = *the last traded total return index of company* i *in event month* t *;*

P_{it-1} = *the last traded total return index in event month* $t-1$.

The monthly benchmark-adjusted return for company i in event month t is calculated by subtracting the monthly benchmark return from the monthly raw return.

$$ar_{it} = r_{it} - r_{mt} \qquad (5.6)$$

where:

ar_{it} = *the market-adjusted return or matched company-adjusted return for company* i *in event month* t *;*

r_{it} = *the return on company* i *in event month* t *;*

r_{mt} = *the market index or matched company return in month* t.

The market index used to obtain the abnormal return depends on the board with which the IPO company is originally listed. The present study utilises value-weighted market indices, as in Ritter (1991), and matching companies based on market capitalisation, the approach employed by Loughran and Ritter (1995). As mentioned in Section 5.3.2.2,

matching companies based on book-to-market ratios cannot be implemented because of a lack of data on book values of equity prior to 1993.

The mean benchmark-adjusted return on a portfolio of n stocks for event month t, AR_t, is the equally-weighted and value-weighted arithmetic mean of the benchmark-adjusted returns.

$$AR_t = \sum_{i=1}^{n_t} \omega_{it} ar_{it} \qquad (5.7)$$

where:

ω_{it} = *the weight,* $1/n_t$ *is used when abnormal returns are equally-weighted and* $MV_i / \sum MV_i$ *is employed when abnormal returns are value-weighted, and*

where:

MV_i = *the IPO company's stock market value (in constant 2002 RM to adjust for inflation*[60]*) on the first trading day.*

As noted by Fama (1998), the choice of weighting scheme depends on the hypothesis of interest to the researcher. According to Loughran and Ritter (2000), *'if one is trying to measure the abnormal returns on the average companies undergoing some event, then each company should be weighted equally...[this] will produce point estimates that are relevant from the point of view of a manager, investor, or researcher attempting to predict the abnormal returns associated with a random event'* (p. 363, note 2).

[60] The formula to adjust for inflation (i.e. convert data year, nominal RM into base year, real RM) is: RM $_{\text{base year}}$ = RM $_{\text{data year}}$ * Consumer Price Index $_{\text{base year}}$ / Consumer Price Index $_{\text{data year}}$. The Malaysian Consumer Price Index (CPI) was obtained from Global Market Information Database. The year 2002 was used as the constant because this is the latest year for which CPI information was available at the time the analysis was carried out.

However, Brav *et al.* (2000) argue that the value-weighted scheme should be employed if the goal of researchers is to quantify the average wealth change of investors subsequent to an event. Therefore, the present study applies both weighting schemes.

The *CAR* from event month q to event month s is calculated by cumulating the mean benchmark-adjusted returns over various intervals during the 36-month aftermarket period, q to s (by summing monthly abnormal returns for 36 months) as follows:

$$CAR_{q,s} = \sum_{t=q}^{s} AR_t \qquad (5.8)$$

If a company in portfolio p drops out due to lack of data, the portfolio return for the next month is an equally-weighted average of the remaining companies in the portfolio. The cumulative mean benchmark-adjusted return for months 1 to 36, $CAR_{1,36}$, thus involves monthly rebalancing to achieve equal-weighting each month (Ritter, 1991, p. 8). This implies that the investors liquidate their portfolio at the end of each event month.

The statistical significance of the mean benchmark-adjusted return (AR) is determined by using the conventional *t*-statistic, which is computed for each period as:

$$t(AR) = AR_t * \sqrt{n_t} / sd_t \qquad (5.9)$$

where:

AR_t = *the mean benchmark-adjusted return for month* t;

n_t = *the number of observations in month* t;

sd_t = *the cross-sectional standard deviations of the adjusted returns for month* t.

The statistical significance of the *CAR* is also determined by using the *t*-statistic employed by Ritter (1991). The *t*-statistic for the *CAR* in month t, $CAR_{1,t}$ is computed as:

$$t(CAR) = CAR_{1,t} * \sqrt{n_t} / csd_t \qquad (5.10)$$

where:

n_t = *the number of companies trading in each month, and* csd_t *is computed as:*

$$csd_t = \left[t * \text{var} + 2 * (t-1) * \text{cov}\right]^{1/2} \qquad (5.11)$$

where:

t = *the event month;*

var = *the mean cross-sectional variance over 36 months;*

cov = *the first-order autocovariance of the* AR_t *series.*

(2) Buy-and-hold abnormal returns (*BHAR*s)

The three-year buy-and-hold abnormal returns are used in this study as an alternative to cumulative mean benchmark-adjusted returns. Adopting the calculation used by Loughran and Ritter (1995), the three-year holding period return for company i is defined as the geometrically compounded return in time t as:

$$BHR_{iT} = \left[\prod_{t=1}^{36}(1+r_{it}) - 1\right] * 100\% \qquad (5.12)$$

where:

r_{it} = *the monthly raw return on company i in event month t;*

This measures the total return from a buy-and-hold strategy where a stock is purchased at the closing market price on the day of listing and held until the earlier of its one-, two-, or three-year anniversary.

The mean buy-and-hold return for both the IPO companies and benchmarks $\overline{BHR_T}$ is calculated as:

$$\overline{BHR_T} = \sum_{i=1}^{n} \omega_i BHR_{iT} \qquad (5.13)$$

where:

ω_{it} = *the weight,* $1/n$ *is used when abnormal returns are equally-weighted and* $MV_i / \sum MV_i$ *is employed when abnormal returns are value-weighted, and*

where:

MV_i = *the IPO company's stock market value (in 2002 RM) on the first trading day.*

The buy-and-hold abnormal returns for each company are calculated by:

$$BHAR_{it} = \left[\prod_{t=1}^{36}(1+r_{it})-1\right] - \left[\prod_{t=1}^{36}(1+r_{mt})-1\right] \qquad (5.14)$$

where:

$BHAR_{it}$ = *the buy-and-hold abnormal return of company* i *in event month* t*;*

r_{it} = *the company's monthly raw return in event month t;*

r_{mt} = *the relevant monthly benchmark return in event month t.*

A positive (negative) value of $BHAR$ indicates that IPOs *over*perform (underperform) a portfolio of benchmarks.

The mean buy-and-hold abnormal return for a period t is defined as:

$$\overline{BHAR_t} = \sum_{i=1}^{n_t} \omega_i BHAR_{it} \qquad (5.15)$$

This study calculates the statistical significance of the mean buy-and-hold abnormal returns using two different procedures as a robustness test. The first procedure is using the conventional *t*-statistic when a matched company benchmark is employed. Barber and Lyon (1997) report that *'...matching sample companies to control companies of similar size and book-to-market ratios yield well specified test statistics in virtually all sampling situations...[and] alleviate the new listing bias...the rebalancing bias...and the skewness bias...'* (p. 370). These three biases have been discussed in Chapter 3.

While the use of the buy-and-hold approach does not assume portfolio rebalancing, the approach increases the likelihood that the long run return distributions will be skewed (Limmack, 2003). Therefore, the second procedure is the calculation of a bootstrapped skewness-adjusted *t*-statistic,[61] as suggested by Lyon *et al.* (1999), when a reference portfolio or market index is used.[62] According to Lyon *et al.* (1999) this statistical method yields *'well-specified test statistics in random samples, and in combination with carefully constructed reference portfolios,...control[s] well for the new listing, rebalancing, and skewness biases'* (p. 166). The bootstrapped skewness-adjusted *t*-statistic is computed as:

[61] This test statistics has been used by Gompers and Lerner (2003).

[62] Jakobsen and Sorensen (2001) proposed a decomposition method which uses a data transformation that enables the cross-sectional long run returns to become log-normally distributed. However, this method is not widely used. Therefore, the present study used skewness-adjusted *t*-statistics as suggested by Lyon *et al.* (1999).

$$t_{sa} = \sqrt{n}\left(S + \frac{1}{3}\hat{\gamma}S^2 + \frac{1}{6n}\hat{\gamma}\right) \tag{5.16}$$

where:

$$S = \frac{\overline{BHAR_t}}{\sigma(BHAR_t)}; \text{ and } \hat{\gamma} = \frac{\sum_{i=1}^{n}(BHAR_{it} - \overline{BHAR_t})^3}{n\sigma(BHAR_t)^3} \tag{5.17}$$

where:

$\hat{\gamma}$ = *the estimate of the coefficient of skewness;*

$\sqrt{n}S$ = *the conventional t-statistic.*

The critical values applied to conventional *t*-statistics are not appropriate when the bootstrapped skewness-adjusted *t*-statistics are used. Thus, the procedure for obtaining an appropriate critical value when using the bootstrapping approach (Lyon *et al.*, 1999, p. 174-175) and testing the abnormal returns of IPO companies is as follows:

(i) Draw 1,000 bootstrapped resamples[63] of size $n_b = n/4$ from the original sample of IPO companies.

(ii) In each resample b, calculate the bootstrapped skewness-adjusted *t*-statistic:

$$t_{sa}{}^{b} = \sqrt{n_b}\left(S^b + \frac{1}{3}\hat{\gamma}^b S^{b2} + \frac{1}{6n_b}\hat{\gamma}^b\right) \tag{5.18}$$

where:

$$S^b = \frac{\overline{BHAR_t^b} - \overline{BHAR_t}}{\sigma^b(BHAR_t)}, \text{ and } \hat{\gamma}^b = \frac{\sum_{i=1}^{n}(BHAR_{it}{}^{b} - \overline{BHAR_t^b})^3}{n_b\sigma^b(BHAR_t)^3} \tag{5.19}$$

[63] The random numbers were generated using the Bernoulli random number generating function.

(iii) All of the bootstrapped skewness-adjusted *t*-statistics $(t_{sa}{}^{b})$ are then ranked from the smallest to the largest. From the 1,000 resamples, the lower-and upper-bound critical values x_1^* and x_u^* are calculated for the transformed bootstrapped skewness-adjusted *t*-statistic $(t_{sa}{}^{b})$. Given the α significance level, the critical values are obtained by solving the following equation:

$$\Pr\left[t_{sa}{}^{b} \le x_1^*\right] = \Pr\left[t_{sa}{}^{b} \ge x_u^*\right] = \frac{\alpha}{2} \qquad (5.20)$$

(iv) The decision rule is as follows: Reject the null hypothesis that the mean long run abnormal return is zero if $t_{sa} < x_1^*$ or $t_{sa} > x_u^*$.

(3) Wealth relatives (*WR*)

The three-year total buy-and-hold returns are then converted into wealth relatives to provide an overall indicator of long run relative performance. Similar to Ritter (1991), wealth relatives are defined as the ratio of the end-of-period wealth from holding a portfolio of issuers to the end-of-period wealth from holding a portfolio of matched companies, or benchmarks, as follows:

$$WR = \frac{1 + mean\ three\ year\ total\ return\ on\ IPOs}{1 + mean\ three\ year\ total\ return\ on\ benchmarks} \qquad (5.21)$$

A wealth relative of greater than 1.00 can be interpreted as meaning that IPOs have *over*performed a portfolio of matched companies or market benchmarks. On the other hand, a wealth relative of less than 1.00 indicates that IPOs underperform their matched companies or benchmarks.

Calendar-time approach

This approach was recommended by Fama (1998), and Mitchell and Stafford (2000). Under this approach, the abnormal returns of the IPO portfolio are calculated in calendar time and each month is weighted equally. Therefore, the problem of cross-sectional dependence among sample IPO companies is eliminated because their returns are aggregated in a single portfolio. The most widely used return-generating model in recent literature is the Fama-French (1993) three-factor model.

(1) Fama and French (1993) three-factor model

The use of event-time returns may overstate the statistical significance of mean abnormal returns because of the cross-sectional dependence of observations (Mitchell and Stafford, 2000). The Fama and French (1993) three-factor model is used to control for event clustering and cross-correlation in IPO returns. This model is employed rather than the Capital Aset Pricing Model (CAPM) because of the well-known failure of the CAPM to describe the cross-section of expected returns (Fama and French, 1993). Fama and French's model contains three factors, which are an overall market factor and factors related to company size and book-to-market equity. As reported by Drew and Veeraraghavan (2002), the factors identified by Fama and French (1992) appear to explain the variation in stock returns in Malaysia. This procedure has also been used by Loughran and Ritter (1995), Brav and Gompers (1997), Espenlaub *et al.* (2000), Gompers and Lerner (2003) and Da Silva Rosa *et al.* (2003), among others.

In order to run a time-series regression using the Fama and French three-factor model with monthly returns, for each calendar month t, the dependent variable consisted of

both equally-weighted and value-weighted returns on a portfolio with surviving IPO companies from the prior 36 months. For example, the January 1994 portfolio would be composed of companies that went public in January 1991 through December 1993. The February 1994 portfolio would be composed of companies that went public in February 1991 through January 1994.[64] Following Lyon *et al.* (1999), the weight for the equally-weighted analysis is calculated as $1/n_t$, while the weight for the value-weighted analysis is calculated as $MV_{it} / \sum_{i=1}^{n_t} MV_{it}$. The three Fama-French factors were regressed on excess returns on the IPO company portfolios, as follows:

$$R_{pt} - R_{ft} = \alpha + \beta(R_{mt} - R_{ft}) + \gamma SMB_t + \delta HML_t + \varepsilon_t \qquad (5.22)$$

where:

R_{pt} = *the IPO portfolio's return*[65] *in month t;*

R_{ft} = *the one-month Malaysian Base Lending Rate,*[66] *observed at the beginning of the month;*

R_{mt} = *monthly market return of the KL Composite Index, the main market indice in Malaysia;*

SMB_t = *the monthly return on the zero investment portfolio for the size factor in the stock returns, namely the difference between the equal-weight mean of the*

[64] This was confirmed in private correspondence with Ritter on 22 July, 2003.

[65] This return is only on a portfolio of IPO companies, not on individual IPO companies.

[66] Due to the absence of data on the return of short term Malaysian Government Bonds prior to February 1994 to proxy for risk free rate, the Malaysian Base Lending Rate was used instead. A similar rate was used by Drew and Veeraraghavan (2002) in their examination of size and value premia for Malaysian market.

returns on a portfolio of small stocks and a portfolio of big stocks, constructed independently from the book-to-market value portfolio;

HML_t = *the monthly return on the zero investment portfolio for the book-to-market equity factor in stock returns, namely the difference between the return on a portfolio of high book-to-market ratio stocks and the return on a portfolio of low book-to-market ratio stocks, constructed independently from the size portfolios.*

In order to construct the mimicking portfolios for the size and book-to-market equity factors, the present study followed the procedure used in Fama and French (1993). Size was calculated as the share price times the number of shares, while the book-to-market ratio was calculated as book common equity (Datastream item 305) for the fiscal year ending in calendar year *t*-1, divided by market equity at the end of December of year *t*-1. In June of each year, *t*, from 1992 to 2000, all KLSE stocks on the Datastream database were ranked by size. The median size value was then used to split the KLSE stocks into two groups, 'small' and 'big' (*S* and *B*). The present study also breaks the KLSE stocks into three book-to-market equity (BE/ME) groups, based on the bottom 30% (low), middle 40% (Medium), and top 30% (High) of the ranked values of BE/ME. During portfolio formation, companies that had negative book value were excluded because they lack meaningful explanations (Drew and Veeraraghavan, 2002). The present study then forms six value-weighted portfolios, (*S/L, S/M, S/H, B/L, B/M, B/H*) as the intersections of the size and book-to-market ratio groups. This indicates that companies that are included in the portfolio are companies that have both market capitalisation and book-to-market ratio figures. For example, *B/H* is the value-weighted return on the portfolio of stocks that are above the KLSE median in size and in the top 30% of book-to-market ratio.

The monthly value-weighted returns on the six portfolios were calculated from July of year t to June of year t+1. Due to lack of data on book to market value for years 1990 and 1991 the portfolio could only be formed in 1992. On the first porfolio formation date, June 1992, size and book-to-market value data were available for 41 KLSE companies and, by June, 2000, for 671 KLSE companies. Then SMB is calculated as $SMB = (S/L + S/M + S/H)/3 - (B/L + B/M + B/H)/3$, and HML is calculated as $HML = (S/H + B/H)/2 - (S/L + B/L)/2$. The intercept α was then used to measure the mean monthly abnormal return of the calendar-time portfolios of IPO companies, and should be equal to zero under the null hypothesis of no abnormal performance.

5.4.1.3 Cross-sectional analysis of long run stock market performance

Besides examining the long run stock market performance using several benchmarks, the present study also investigates the cross-sectional pattern of this performance by categorising the sample of IPO companies based on the year of listing, the industrial sector classification, the board of listing, the size measured by market capitalisation, the type of companies - either private or privatisation, the gross proceeds raised, and the initial returns. Since the buy-and-hold returns measures are more relevant for investors (Fama, 1998; Teoh *et al,* 1998a), the cross-sectional analysis is based only on this measure.

A paired sample t-test was used to determine whether there is a significant difference between the mean values of the buy-and-hold returns between IPO companies and benchmarks within each category. The binomial proportionality test statistic was also employed to test whether the percentage (p) of IPO companies underperforming their

benchmark is different from what would be expected by chance (i.e. 50%). The test statistic z (assumed to be normally distributed) is calculated as:

$$z = (p_0 - 0.5) * (n \div 0.25)^{1/2} \qquad (5.23)$$

where:

p_0 = *percentage of underperformance;*

n = *number of paired IPO-benchmark comparisons*

The critical z values are 2.575, 1.960, and 1.645 at the 1, 5, and 10% levels, using a two-tailed test.

5.5 Summary

This chapter explains the research design employed to examine the share price performance of Malaysian IPOs. Data sources and sample selection for individual companies, together with size-matched companies and market benchmarks, are explained. The distribution of the final sample is then described based on the year of listing. It has been argued (e.g., Fama, 1998; Ritter, 2003; Gompers and Lerner, 2003) that the conflicting results found in prior studies may have been caused by methodological differences in the identification of long run returns. Consequently, the present study uses several methods for measuring returns, different benchmarks to adjust the returns, and appropriate statistical tests to test the significance of the abnormal returns. The variety of methods provides a robustness test for the findings and is also motivated by the ongoing discovery of biases in event studies involving long horizon returns. The variables employed to investigate the cross-sectional pattern of

long run performance are also identified. The following chapter provides the results of the stock market performance.

Chapter 6

Results on stock market performance

6.1 Introduction

The present chapter provides evidence on the share price performance of Malaysian IPOs and is divided into four sections. The first presents a description of the composition of the sample by year and board of listing, sector, type of IPOs, and gross proceeds raised. The descriptive statistics of the market value and gross proceeds raised are also provided. The second presents the initial returns to shareholders, while the third provides evidence on the long run share price performance of IPO companies based on two approaches: event-time and calendar-time. The third section also presents the cross-sectional pattern in the long-run performance of IPOs based on the buy-and-hold return measure. The long run performance is analysed by categorising the sample of IPO companies by year of listing, sector, board of listing, size, type of companies - private or privatisation, gross proceeds, and initial returns. The final section concludes the current chapter.

6.2 Composition of companies

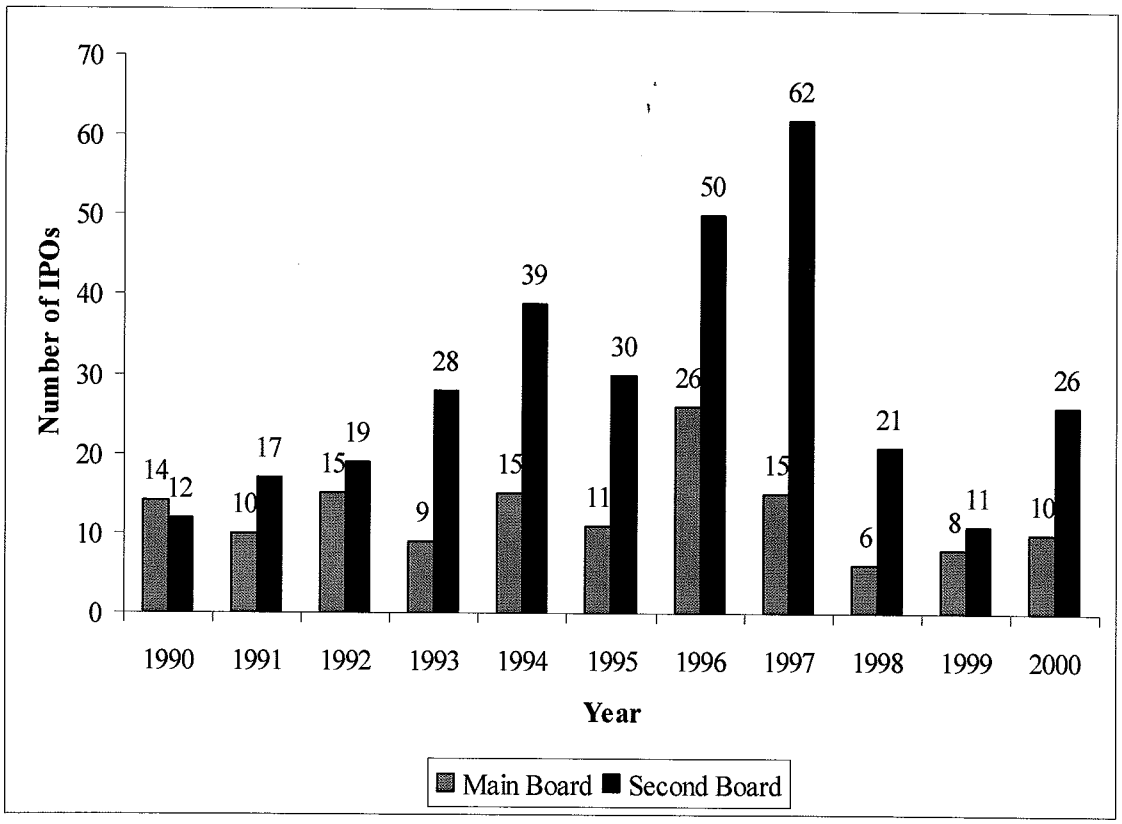
6.2.1 Composition by year and board of listing

Figure 6.1 displays the annual number of listed IPOs used as a sample in the current study for each calendar year during 1990 to 2000 by board of listing. As seen from Figure 6.1, most IPOs occurred during the period from 1993 to mid-1997, which coincided with an economic boom in Malaysia prior to the East Asian crisis. A high volume of IPOs occurred in the years 1996 and 1997 and a low volume occurred in the

year 1999. Heavy issuance activity in 1996 and 1997 was associated with a bull market while small issuance activity in 1999 was associated with a bear market.

As shown in Figure 6.1, most IPO companies sought a listing on the Second Board of the KLSE. There has been an increasing trend in the number of newly listed companies on the Second Board since 1990, which peaked at 62 in 1997. However, there was a sharp decline after 1997, corresponding to the period of the economic crisis that hit Asian countries from mid 1997 to the third quarter of 1999. Of the final sample, 139 IPOs are listed on the Main Board, while 315 are from smaller companies listed on the Second Board.

Figure 6.1 The composition of IPO companies by year and board of listing



6.2.2 Composition by KLSE sector

Table 6.1 shows the distribution of IPOs by sector based on the KLSE industrial classification. The distribution was relatively concentrated on the Industrial Products sector, the Trading/Services sector and the Consumer Products sector with 182 IPOs, 99 IPOs and 82 IPOs, respectively. The lowest number of IPOs occurred in the Hotel sector.

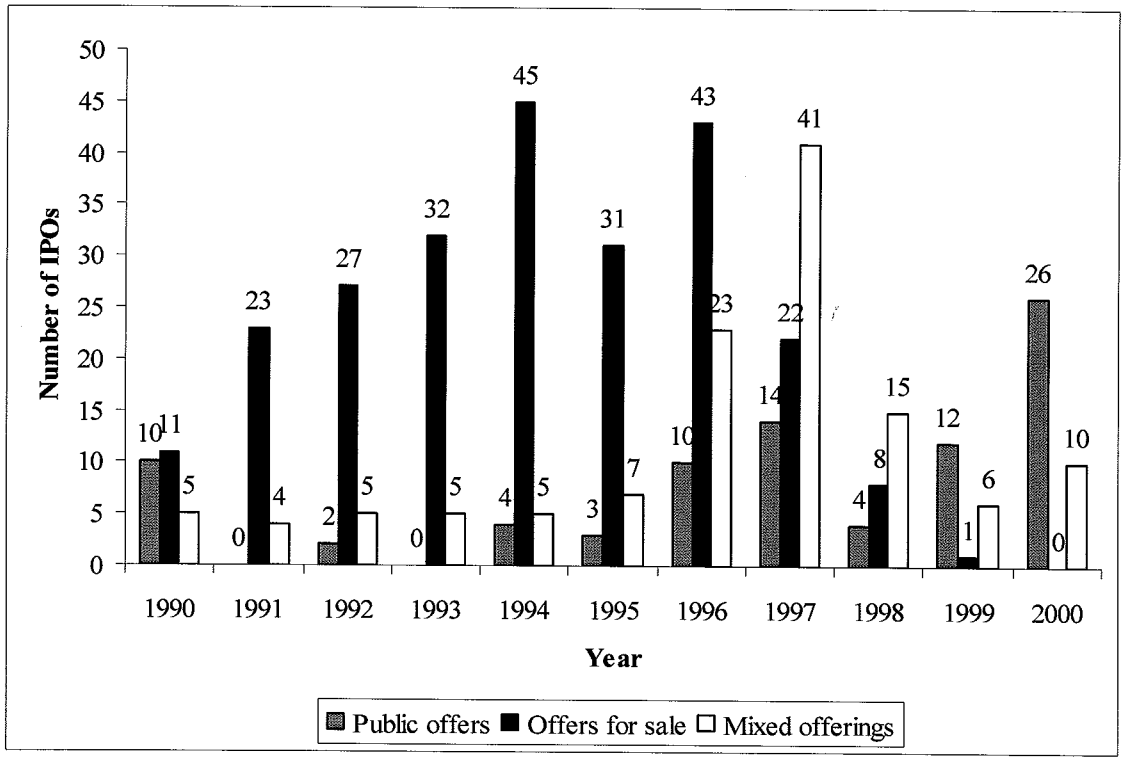
Table 6.1 Distribution of IPOs by KLSE sector classification

	Number			
	Main Board	**Second Board**	**Total**	**%**
Construction	13	35	48	10.6
Consumer Products	15	67	82	18.1
Hotel	2	0	2	0.4
Industrial Products	42	140	182	40.1
Plantations	8	2	10	2.2
Properties	24	4	28	6.2
Technology	1	2	3	0.7
Trading/Services	34	65	99	21.8
Number of companies	139	315	454	100.0

6.2.3 Composition by types of IPOs

Figure 6.2 shows the sample distribution of IPOs by types across time between 1990 and 2000. Prior to 1997, the most frequent types of IPO were offers for sale, while the mixed offerings became more popular in 1996 and 1997. Public offers were less popular prior to 1996, but become more common in later years.

Figure 6.2 The composition of IPO companies by types of IPOs



6.2.4 Composition by gross proceeds

Table 6.2 reports the gross proceeds raised from IPOs. The gross proceeds raised by the sample of IPO companies during the period 1990 to 2000 was RM16,916 million, with RM4,713 million, RM7,644 million, and RM4,559 million raised from public offerings, offers for sale and mixed offerings respectively. The highest total gross proceeds was RM3,590 million in 1992 while the lowest was RM526 million in 1991. However, there were no gross proceeds raised from public offers in 1991 and 1993, or from offers for sale in 2000. Among the sample of IPO companies, Tenaga Nasional Berhad (a utilities industry privatisation IPO) raised the largest amount (RM2,813 million) while Len Brothers (a private IPO from the basic industry sector) the lowest (RM3.3 million).

Table 6.2 Gross proceeds raised by types of IPOs, 1990-2000

Year	Public offers (in million RM)	Offers for sale (in million RM)	Mixed offerings (in million RM)	Total (in million RM)
1990	144.3	2,807.4	77.6	3,029.3
1991	0.0	488.1	38.0	526.1
1992	2,828.8	508.1	253.3	3,590.2
1993	0.0	536.5	123.9	660.5
1994	52.7	1,046.1	97.2	1,196.0
1995	151.1	461.5	184.1	796.6
1996	279.0	1,082.5	628.0	1,989.6
1997	461.3	581.7	1,389.8	2,432.8
1998	41.0	125.1	645.0	811.0
1999	229.4	6.9	726.8	963.2
2000	525.1	0.0	395.6	920.7
Total	4,712.7	7,643.9	4,559.3	16,916.0

Note:
The gross proceeds data are in nominal values, without adjustment for inflation.

6.2.5 Descriptive statistics

Table 6.3 reports the descriptive statistics of the market value at the time of listing and gross proceeds. The data is expressed in constant 2002 RM, adjusted using the Consumer Price Index. Panel A, Panel B and Panel C of Table 6.3 report the descriptive statistics for all 454 IPOs, 139 IPOs listed on the Main Board, and 315 IPOs listed on the Second Board, respectively.

The mean market value for 454 IPOs is RM384.72 million. The lowest and highest market value at the time of listing for 454 IPOs are RM0.11 million (a private IPO company named Suiwah Corporation Bhd) and RM36,166.11 million (a privatisation IPO company named Tenaga Nasional Bhd), respectively. On average, IPO companies listed on the Main Board have a higher market value of RM907.24 million, within the range of RM82.89 million to RM36,166.11 million. On the other hand, compared to

IPOs listed on the Main Board, IPO companies listed on the Second Board have a lower mean market value of RM154.15 million, with the highest and lowest market values being RM0.11 million and RM1,112.67 million, respectively. The highest gross proceeds of RM3,875.23 million were raised by the same privatisation company, Tenaga Nasional Bhd, while the lowest gross proceeds of RM4.28 million were raised by Comsa Farms Bhd, a private company listed on the Second Board.

Table 6.3 Descriptive statistics of market value and gross proceeds

Variable	Mean	StDev	Minimum	Median	Maximum	Skewness	Kurtosis
Panel A: All IPOs (n=454)							
Real market value at the time of listing (in million RM)	384.72	1,907.93	0.11	165.83	36,166.11	16.34	289.29
Real gross proceeds (in million RM)	47.45	246.07	4.28	18.90	3,875.23	14.42	213.20
Panel B: Main Board (n=139)							
Real market value at the time of listing (in million RM)	907.24	3,394.50	82.89	387.99	36,166.11	9.15	89.69
Real gross proceeds (in million RM)	113.43	438.20	6.38	42.49	3,875.23	8.00	64.58
Panel C: Second Board (n=315)							
Real market value at the time of listing (in million RM)	154.15	115.51	0.11	116.64	1,112.67	2.99	16.40
Real gross proceeds (in million RM)	18.34	13.78	4.28	14.99	121.59	3.31	15.94

Note:

Real value is expressed in constant 2002 RM, adjusted using the Consumer Price Index.

6.3 Initial returns

Panel A of Table 6.4 presents the descriptive statistics of raw initial returns and market-adjusted initial returns for the sample of 454 Malaysian IPO companies listed from January 1990 to December 2000. The initial returns for each board of listing are also reported. The overall raw initial returns to shareholders range from a low of -53.85% to a high of 400%. The minimum initial return is reported in 1998 by a company called Waste Water Engineering (M) Bhd, which was listed on the Second

Board of the KLSE on 12 January, 1998. The offer price for this company was RM3.90 and its closing price on the first day of listing was RM1.80, which generated a negative initial return of -53.85%. The maximum initial raw return of 400% was reported in 1996 and 1997 by two companies named Transocean Holdings Bhd and Magna Prima Berhad, which were both listed on the Second Board of the KLSE on 28 March, 1996 and 16 January, 1997. The offer price for Transocean Holdings Bhd was RM2.10 and its closing price on the first day of listing was RM10.50. Meanwhile, the offer price for Magna Prima Berhad was RM2.50 and its closing price on the first day of listing was RM12.50, which both produced positive initial returns of 400%.

During the period 1990 to 2000, the overall mean raw initial returns and mean abnormal initial returns were 95.16% and 95.97%, which are consistent with previous findings on the high level of underpricing in Malaysia. For example, 166.67% is reported by Dawson (1987), 167.4% by Yong (1991), 80.3% by Loughran *et al.* (1994), 61.8% by Paudyal *et al.* (1998), and 99.04% by Jelic *et al.* (2001). As estimated by the market adjusted returns model, the mean abnormal initial return is statistically significant at the 1% level with a *t*-statistic of 23.58, thus rejecting the null hypothesis that there is no abnormal return to IPO companies shareholders who purchase the shares on the offering date and sell them on the first day of trading. Both raw initial returns and KLCI-adjusted initial returns are 'positively skewed'.

Since the sample of companies consists of both private and privatisation IPOs (PIPOs), Panels B and C of Table 6.4 report the results for private and PIPOs, respectively. PIPO companies produce slightly higher initial returns than the private IPO companies (both raw and abnormal) but the difference is not statistically significant. The higher initial

Table 6.4 Raw and abnormal initial returns* for 454 Malaysian IPOs, listed in 1990-2000

	Raw initial returns			Market-adjusted initial returns		
	Main Board	Second Board	All	Main Board	Second Board	All
Panel A: All IPOs						
Mean	88.48[a]	98.11[a]	95.16[a]	88.99[a]	99.04[a]	95.97[a]
Standard deviation	78.77	91.80	88.04	76.22	90.92	86.72
Minimum	-37.20	-53.85	-53.85	-16.36	-37.08	-37.08
Median	78.46[a]	74.78[a]	76.49[a]	78.81[a]	76.34[a]	77.39[a]
Maximum	386.84	400.00	400.00	390.90	400.10	400.10
Skewness	1.10	1.19	1.19	1.23	1.22	1.25
Kurtosis	1.46	1.21	1.36	1.80	1.25	1.47
Number of companies	139	315	454	139	315	454
Panel B: Private IPOs						
Mean	85.07[a]	98.11[a]	94.51[a]	85.58[a]	99.04[a]	95.33[a]
Standard deviation	76.87	91.80	88.04	74.04	90.92	86.71
Minimum	-37.20	-53.85	-53.85	-16.36	-37.08	-37.08
Median	71.43[a]	74.78[a]	74.29[a]	74.81[a]	76.34[a]	76.23[a]
Maximum	386.84	400.00	400.00	390.90	400.10	400.10
Skewness	1.21	1.19	1.22	1.34	1.22	1.28
Kurtosis	1.93	1.21	1.44	2.34	1.25	1.56
Number of companies	120	315	435	120	315	435
Panel C: Privatisation IPOs						
Mean	110.00[a]	na^	110.00[a]	110.50[a]	na	110.50[a]
Standard deviation	89.00	na	89.00	87.90	na	87.90
Minimum	0.00	na	0.00	4.00	na	4.00
Median	114.50[a]	na	114.50[a]	111.00[a]	na	111.00[a]
Maximum	325.00	na	325.00	323.90	na	323.90
Skewness	0.61	na	0.61	0.72	na	0.72
Kurtosis	0.26	na	0.26	0.36	na	0.36
Number of companies	19	na	19	19	na	19
t-stat for private IPO and PIPO difference	-1.287	na	-0.752	-1.329	na	-0.748
z-stat for private IPO and PIPO difference	-1.180	na	-0.877	-1.134	na	-0.830

Note:

[a] Significantly different from zero at the 0.01 level, using a two-tailed test. The parametric *t*-test is used for means and the Wilcoxon signed-ranks test is used for the medians. The difference in mean and median initial returns between private IPOs and privatisation IPOs is based on the independent *t*-test and the Mann-Whitney U test.

* The initial return is defined as the return from the offering price to the closing price on the first day of listing. The market-adjusted initial return is defined as the initial raw return minus the return on the KL Composite Index (KLCI) during the corresponding period.

^ na = not applicable as all PIPOs listed on the Main Board.

returns to PIPO shareholders are consistent with the result observed by Paudyal *et al.* (1998). However, they found the difference between 18 PIPOs and 77 private IPOs listed during 1984 to 1995 was statistically significant at the 5% level. The insignificant

result observed in the present study may be due to the different time period examined and the small number of PIPOs relative to private IPOs.

The long run returns are discussed next.

6.4 Long run returns

This section presents the results of the analyses of the stock market performance of Malaysian IPOs in the three-year period following listing. It is interesting to investigate the long run performance of IPOs for investors who purchase the shares on the first day of listing, as few investors are able to purchase shares at the subscription price because of the high over-subscription rate. The results are presented in two parts. The first provides the results from the event-time approach, while the second presents those from the calendar-time approach.

6.4.1 Event-time approach

6.4.1.1 Cumulative mean abnormal returns (*CAR*s)

Matched company benchmark

Table 6.5 reports the cumulative mean matched company-adjusted returns ($CAR_{1,t}$) for the first 12 months, and for months 18, 24, 30 and 36 after the listing date for 452 IPOs occurring between 1990-2000, with the number of IPOs reported in Column 2. For completeness, the mean monthly abnormal return (AR_t) is also reported. Two

companies were excluded from the original sample of 454 as these companies[67] had extremely high market capitalisations, which made it impractical to match them with other companies with similar characteristics. The share price data was last collected on 7 July, 2003. As a result, the number of companies having the full 36 months of returns is less than the total number of companies in the sample. Column 5 reports the *CAR*s calculated by equal-weighting, with the associated *t*-statistics in Column 6. Column 9 presents the *CAR*s obtained from the value-weighting scheme, with the *t*-statistic in Column 10.

Table 6.5 Cumulative equally-weighted (EW) and value-weighted (VW) mean abnormal returns adjusted for a size-matched company

Month of seasoning	Number of companies trading	Equally-weighted				Value-weighted			
		AR_t (%)	*t*-stat	$CAR_{1,t}$ (%)	*t*-stat	AR_t (%)	*t*-stat	$CAR_{1,t}$ (%)	*t*-stat
1	452	-0.52	-0.43	-0.52	-0.51	-1.29	-1.07	-1.29	-1.26
2	452	1.65	1.62	1.13	0.78	1.52	1.49	0.23	0.16
3	452	-0.59	-0.57	0.55	0.31	-1.51	-1.47	-1.27	-0.72
4	452	1.63[c]	1.70	2.18	1.06	0.38	0.40	-0.89	-0.44
5	452	0.40	0.47	2.58	1.13	0.11	0.13	-0.78	-0.34
6	452	1.60	1.58	4.18[c]	1.66	-0.30	-0.29	-1.08	-0.43
7	452	2.13[b]	2.00	6.31[b]	2.33	1.38	1.29	0.30	0.11
8	452	1.83	1.55	8.14[a]	2.81	2.58[b]	2.19	2.88	0.99
9	452	0.06	0.07	8.20[a]	2.67	-0.36	-0.39	2.53	0.82
10	452	-0.47	-0.44	7.73[b]	2.38	0.25	0.24	2.78	0.86
11	452	-1.44	-1.55	6.28[c]	1.85	-2.10[b]	-2.25	0.68	0.20
12	452	-0.84	-0.87	5.44	1.53	-0.64	-0.66	0.04	0.01
:	:	:	:	:	:	:	:	:	:
18	452	-2.41*	-0.91	3.03	0.70	-4.58*[c]	-1.73	-4.54	-1.05
24	452	-1.48	-0.59	1.55	0.31	-1.24	-0.50	-5.78	-1.15
30	452	-3.96[c]	-1.67	-2.41	-0.43	-2.56	-1.02	-8.34	-1.49
36	433	2.84	1.09	0.43	0.07	0.18	0.07	-8.16	-1.30

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05 and 0.10 levels, respectively, using a two-tailed test.

* This is the *CAR* with the associated *t*-statistics over the 6 month period.

[67] The two companies are Syarikat Telekom Malaysia Bhd, listed on 7 November, 1990 with a market capitalisation of RM13,793.5 million and Tenaga Nasional Bhd, listed on 28 May, 1992 with a market capitalisation of RM29,850 million. Both companies were government-owned companies which were privatised by means of an IPO.

It is evident that the equally-weighted *CAR*s are significant from months 6 to 11. The highest *CAR*, of 8.20%, occurs in the ninth month of seasoning (*t*-stat = 2.67). The *CAR*s fall to 0.43% by the end of month 36, although this slight *over*performance is not statistically significant (*t*-stat = 0.07). The null hypothesis that the cumulative mean abnormal return over the 36-month interval is equal to zero is thus accepted. The results from the equally-weighted *CAR*s indicate that while the Malaysian IPOs temporarily *over*perform their matched companies in the first year of seasoning, on average they do not display any abnormal performance over the three-year horizon.[68] This finding is consistent with the results reported by Jelic *et al.* (2001) concerning the long run performance of Malaysian IPOs, using matched companies as a benchmark with equally-weighted returns.

When value-weighted abnormal returns are calculated, the reported *CAR*s are much lower, falling to -8.16% by the end of month 36. These lower *CAR*s indicate that large IPO companies perform less well than smaller IPO companies. However, these *CAR*s are not statistically significant (*t*-stat = -1.30).

The results of the *CAR*s by using market benchmarks are discussed next.

[68] As a robustness check, the present study also calculates the cumulative abnormal return for each company at months 12, 24 and 36. The minimum cumulative abnormal returns for individual companies at months 12, 24, and 36 are found to be -279.87%, -301.18%, and -246.14%, respectively. On the other hand, the maximum cumulative abnormal returns for individual companies at months 12, 24, and 36 are found to be 241.80%, 291.87%, and 389.12%, respectively. The median, mean, and 5% trimmean value of cumulative abnormal returns for companies that have a full set of 36 monthly returns are all similar (1.35%, -0.11%, and -1.12%, respectively), indicating that the results are not driven by outliers.

Market benchmark

(1) KL Composite Index (KLCI)

Table 6.6 presents the long run stock market performance of Malaysian IPOs estimated by the market adjusted returns model. It reports the *CAR*s adjusted for the KL Composite Index for the 36 months after the listing date for the full sample of 454 IPOs. As observed in Column 5, there is a steady increase in the equally-weighted *CAR*s

Table 6.6 Cumulative equally-weighted (EW) and value-weighted (VW) mean abnormal returns adjusted for the main market benchmark (KL Composite Index)

Month of seasoning	Number of companies trading	Equally-weighted				Value-weighted			
		AR_t (%)	*t*-stat	$CAR_{1,t}$ (%)	*t*-stat	AR_t (%)	*t*-stat	$CAR_{1,t}$ (%)	*t*-stat
1	454	-0.81	-0.73	-0.81	-1.00	-0.56	-0.51	-0.56	-0.69
2	454	2.69[a]	3.13	1.88	1.64	3.14[a]	3.65	2.58[b]	2.25
3	454	1.01	1.39	2.89[c]	2.06	2.10[a]	2.91	4.68[a]	3.34
4	454	1.68[b]	2.02	4.56[a]	2.82	0.84	1.01	5.52[a]	3.42
5	454	-0.86	-1.25	3.71[c]	2.05	-2.36[a]	-3.45	3.16[c]	1.75
6	454	2.07[b]	2.55	5.78[a]	2.92	0.99	1.21	4.15[b]	2.09
7	454	1.41	1.50	7.19[a]	3.36	2.37[b]	2.52	6.51[a]	3.05
8	454	2.85[a]	3.26	10.05[a]	4.39	1.40	1.60	7.91[a]	3.46
9	454	1.02	1.31	11.07[a]	4.56	-2.44[a]	-3.14	5.47[b]	2.26
10	454	1.53[b]	2.10	12.60[a]	4.93	0.78	1.07	6.25[b]	2.45
11	454	-1.10	-1.57	11.50[a]	4.29	-2.39[a]	-3.41	3.86	1.44
12	454	0.46	0.64	11.96[a]	4.27	-2.67[a]	-3.66	1.19	0.42
:	:	:	:	:	:	:	:	:	:
18	454	6.40*[a]	3.22	18.36[a]	5.35	6.07*[a]	3.05	7.26[b]	2.12
24	454	3.54[c]	1.82	21.90[a]	5.53	-2.46	-1.27	4.80	1.21
30	454	3.58[c]	2.00	25.48[a]	5.75	-3.91[b]	-2.19	0.89	0.20
36	435	7.15[a]	3.28	32.63[a]	6.58	-0.14	-0.07	0.75	0.15

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

* This is the *CAR* with the associated *t*-statistics over the 6 month period.

when the main market index is used as the benchmark. After a slight decrease in the first month of seasoning, the *CAR*s turn positive in the second month with a value of 1.88% (*t*-stat = 1.64) and increase gradually to 32.63% (*t*-stat = 6.58) by the end of month 36. This *over*performance is lower than that reported by Corhay *et al.* (2002),

who found a cumulative equally-weighted mean market-adjusted return of 41.71% over the three years from the listing day for a sample of 258 Malaysian IPOs during the period 1992 to 1996. However, the *over*performance found in the present study is higher than that reported by Jelic *et al.* (2001) who found a three-year cumulative equally-weighted mean market-adjusted return of 24.83% for 182 Malaysian IPOs between 1980 and 1995. These differences reflect the number of companies employed in the present study that comprises a large number of Second Board listed companies (315 IPOs) as compared to 184 IPOs and no Second Board IPOs, used by Corhay *et al.* (2002) and Jelic *et al.* (2001), respectively.

It is of interest to note that when the value-weighted scheme is used to produce the abnormal returns for the present study, the *CAR*s drop to 0.75% by the end of month 36. However, this slight *over*performance is not statistically significant, which indicates that there is no significant difference between the performance of IPO companies and the market benchmarks in the three years after the IPOs. The results clearly show that the long run performance measure is sensitive to the weighting scheme employed to calculate abnormal returns. The lower reported *CAR*s when the value-weighting is used supports the initial view of the present study that large IPO companies perform less well than small IPO companies, as discussed in Section 6.5 below. The next section discusses the long run performance when the EMAS/Second Board Index is used as the market benchmark.

(2) EMAS/Second Board Index

As a final check on the robustness of the results using a market benchmark, the results using the alternative market benchmarks are now reported. Due to the fact that IPO

companies are listed either on the Main Board or the Second Board of the KLSE, the appropriate board indices are now used as the benchmark portfolio, i.e. each Main (Second) Board IPO is compared with the EMAS (Second Board) index return.

Table 6.7 reports the cumulative mean EMAS/Second Board Index-adjusted returns for the 36 months after the listing date for 454 Malaysian IPOs in the period 1990-2000. It is evident from Column 5, following a small negative return in the first month, the equally-weighted *CAR* turns positive and, by the end of 36 months of seasoning, reaches a value of 31.15%, which is statistically significant at the 1% level. This is consistent with the reported value for the equally-weighted *CAR* when the KL Composite Index is used as a benchmark. The value-weighted *CAR* using the alternative market benchmark (board indices) is lower and insignificant, reaching 4.05% by the end of month 36, again consistent with the results in Table 6.6.

Overall, the results of the present study are in agreement with the results concerning Malaysian IPOs reported in Jelic *et al.* (2001) as well as in Kim *et al.* (1995) for IPOs in Korea. However, the results differ from those emanating from the US reported by Ritter (1991), Loughran and Ritter (1995), Gompers and Lerner (2003) and the UK results reported by Levis (1993), Khurshed *et al.* (1999), among others. These comparisons are based on the equally-weighted analysis, which is mainly adopted in prior studies. From inspection of the data, all of the sample IPOs of the present study survived three years after listing, in contrast to the finding of Gompers and Lerner (2003), who report that around 29% of their IPOs were delisted prior to the third anniversary. Therefore, the results of the present study are free from any 'survivorship

bias'.[69] The difference in the percentage of surviving companies after listing may provide a reason for the different findings for Malaysia compared to other markets. This suggests that the performance of Malaysian IPOs might be better because they survive for up to three years without being suspended, liquidated or taken over. In contrast, Bhabra and Pettway (2003) report that their sample of failed US IPO companies, which were delisted due to financial distress, showed significant underperformance compared to non-failed companies.

Table 6.7 Cumulative equally-weighted (EW) and value-weighted (VW) mean abnormal returns adjusted for the alternative market benchmark (EMAS or Second Board Index)

Month of seasoning	Number of companies trading	Equally-weighted				Value-weighted			
		AR_t (%)	*t*-stat	$CAR_{1,t}$ (%)	*t*-stat	AR_t (%)	*t*-stat	$CAR_{1,t}$ (%)	*t*-stat
1	454	-0.21	-0.20	-0.21	-0.30	-0.26	-0.25	-0.26	-0.37
2	454	2.79[a]	3.62	2.58[a]	2.59	3.22[a]	4.17	2.96[a]	2.98
3	454	0.90	1.43	3.48[a]	2.86	2.27[a]	3.60	5.23[a]	4.30
4	454	1.90[a]	2.67	5.38[a]	3.81	0.84	1.18	6.07[a]	4.33
5	454	0.66	1.06	6.04[a]	3.83	-1.52[b]	-2.44	4.55[a]	2.90
6	454	2.51[a]	3.32	8.55[a]	4.95	0.67	0.89	5.22[a]	3.04
7	454	2.35[a]	2.93	10.9[a]	5.85	3.19[a]	3.97	8.41[a]	4.53
8	454	2.46[a]	3.30	13.36[a]	6.70	1.49[b]	1.99	9.90[a]	4.99
9	454	0.58	0.91	13.95[a]	6.60	-2.33[a]	-3.63	7.57[a]	3.60
10	454	1.28[b]	2.00	15.23[a]	6.83	1.20[c]	1.88	8.77[a]	3.95
11	454	-1.14[c]	-1.84	14.08[a]	6.03	-2.36[a]	-3.80	6.41[a]	2.75
12	454	0.20	0.34	14.29[a]	5.85	-2.87[a]	-4.86	3.53	1.45
:	:	:	:	:	:	:	:	:	:
18	454	3.93*[b]	2.26	18.22[a]	6.10	6.88*[a]	3.94	10.41[a]	3.50
24	454	4.64[a]	2.83	22.86[a]	6.63	-0.95	-0.58	9.46[a]	2.75
30	454	2.31	1.52	25.17[a]	6.53	-4.67[a]	-3.09	4.79	1.25
36	435	5.98[a]	3.12	31.15[a]	7.22	-0.74	-0.39	4.05	0.94

Note:

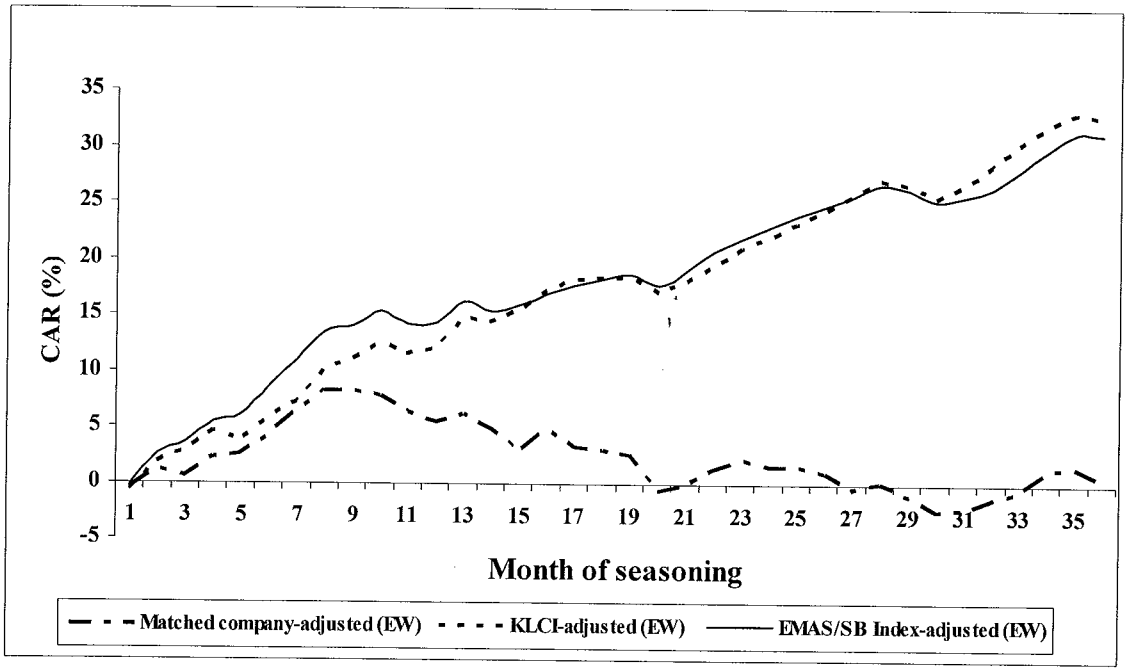
[a, b, and c] Significantly different from zero at the 0.01, 0.05 and 0.10 levels, respectively, using a two-tailed test.

* This is the *CAR* with the associated *t*-statistics over the 6 month period.

[69] Survivorship bias results from the exclusion of failed companies and those absorbed into other companies by acquisition.

The *CAR*s figures in Table 6.5, Table 6.6 and Table 6.7 are plotted in Figure 6.3 and Figure 6.4. Figure 6.3 plots the equally-weighted *CAR*s, while Figure 6.4 plots the value-weighted *CAR*s of 454 Malaysian IPOs listed in 1990-2000, with monthly rebalancing. Three series are plotted for the 36 months after the listing date: (i) Matched company-adjusted; (ii) KLCI-adjusted; and (iii) EMAS/Second Board Index-adjusted. The matched company-adjusted series is constructed from the sample of 452 IPOs after excluding two outliers.

Figure 6.3 Cumulative equally-weighted mean abnormal returns

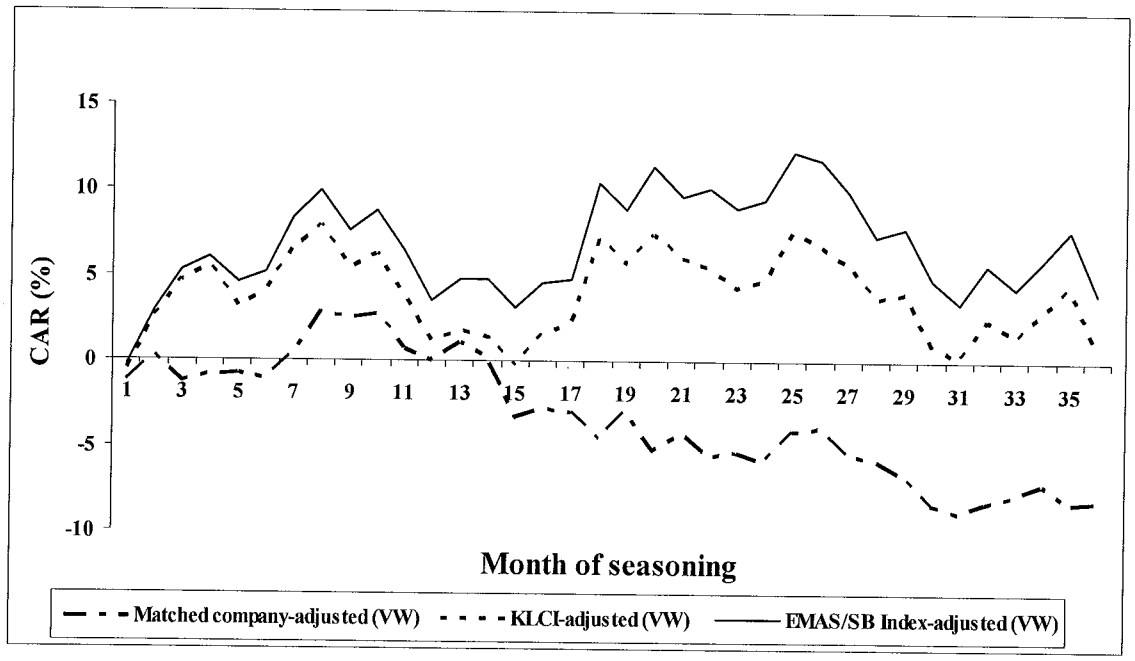


Focusing first on Figure 6.3, it can be observed that the two market-adjusted *CAR*s display similar patterns, which can be attributed to similar performances by the two indices. The matched company-adjusted *CAR*s have a quite different pattern to those derived from the other benchmarks, peaking at 8.20% in month nine and hovering around zero from months 20 to 36. This result indicates that IPO companies do not significantly underperform or *over*perform non-IPO companies of similar size in the

long run. The results displayed in Figure 6.3 are consistent with other long horizon returns studies in that long run performance is sensitive to the benchmark employed.

Figure 6.4 plots the same returns as those shown in Figure 6.3, but uses the value-weighting scheme. It is noticeable that the *CAR*s for all benchmarks show a decline in performance over the three years after listing. Both of the cumulative mean market-adjusted returns show a parallel pattern of increasing and decreasing values over time. The *CAR*s using the KLCI is lower than the *CAR*s using the EMAS/Second Board Index, but both remain above zero at month 36. The matched company-adjusted *CAR*s exhibit a decreasing value over time and fall to below zero at month 36. Overall, when the value-weighting scheme is employed, IPO companies insignificantly *over*perform relative to their market benchmarks, but also insignificantly underperform relative to size-matched companies for the entire 36 month window.

Figure 6.4 Cumulative value-weighted mean abnormal returns



Gompers and Lerner (2003, p. 1358) point out that the *CAR* method tends to misrepresent performance when returns are highly volatile. Therefore, further evidence on the long run performance of Malaysian IPOs is presented in the next section using buy-and-hold abnormal returns and wealth relative measures.

6.4.1.2 Buy-and-hold abnormal returns (*BHAR*s) and wealth relatives

This section reports the second and third measures of long run performance using matched company benchmark and market benchmarks.

Further evidence on the long run stock market performance of Malaysian IPOs is presented in Tables 6.8 and 6.9. These tables report the equally-weighted and value-weighted mean one-, two-, and three-year buy-and-hold abnormal returns (*BHAR*s) and wealth relatives for the 454 companies that went public during the period 1990 to 2000, using size-matched companies, the KL Composite Index and the EMAS/Second Board Index, respectively.

Matched company benchmark

Table 6.8 reports the long run stock market performance using matched companies as a benchmark. The number of sample companies is less than 452 in the third year because the returns data were last collected from Datastream on 7 July, 2003. Therefore, those companies that have full 36 monthly returns is only 433. Panel A, Panel B and Panel C report the mean raw returns, abnormal returns and wealth relatives, respectively.

The equally-weighted mean raw IPO returns for one-, two-, and three-year holding period are 12.36%, 33.30%, and 34.32%, respectively. Meanwhile, the mean raw

size-matched company returns for one-, two-, and three-year holding periods are 13.48%, 32.08%, and 36.33%, respectively. Therefore, the size-matched company-adjusted benchmarks produce equally-weighted mean *BHAR*s of -1.12%, 1.22%, and -2.01% for one-, two-, and three-year holding periods, respectively. The mean one-year *BHAR*s underperformance is insignificant (*t*-statistic = -0.22), which is also true of the corresponding one-year wealth relative of 0.99. The small underperformance in year one does not continue in year two. Over a two-year window, the mean *BHAR*s are positive but not statistically significant (*t*-statistic = 0.16), while the wealth relative increases to 1.01. However, the overall three-year wealth relative presented in the table decreases to 0.99, which is also reflected in the negative three year mean *BHAR*s of -2.01. This slight underperformance of IPO companies relative to a matching company, matched by market capitalisation, is, however, not statistically significant (*t*-statistic = -0.27). This indicates that, on average, investors buying IPO shares on the first day of listing and holding them for a three-year period cannot generate significant abnormal returns. This result is consistent with that of Jelic *et al.* (2001), who found that their sample of 182 Malaysian IPO companies between 1980 and 1995 on average seem to insignificantly underperform their matched companies after three years.

The value-weighted mean *BHAR*s for one-, two-, and three-years are all negative but not statistically significant. This result is consistent with that obtained using the value-weighted *CAR* measure, which produces a greater fall in returns, indicating that the performance of large IPO companies is inferior to that of small IPO companies.

Table 6.8 Mean one-, two- and three-year raw returns, buy-and-hold abnormal returns and wealth relatives using size-matched companies

	Equally-weighted			Value-weighted		
	1-year	2-year	3-year	1-year	2-year	3-year
Panel A: Mean raw buy-and-hold returns (%)						
IPO company	12.36	33.30	34.32	-3.96	-4.60	-3.40
Matched company	13.48	32.08	36.33	-1.15	-2.28	6.81
Panel B: Mean buy-and-hold abnormal returns (%)						
Matched company-adjusted	-1.12	1.22	-2.01	-2.82	-2.32	-10.21
t-statistic	-0.22	0.16	-0.27	-0.56	-0.30	-1.36
Panel C: Wealth relatives						
Matched company-adjusted	0.99	1.01	0.99	0.97	0.98	0.90
Number of companies	452	452	433	452	452	433

Market benchmarks: KL Composite Index and EMAS/Second Board Index

This section reports the long run return when market benchmarks are used. Results using the main market indices are reported first and are followed by the results using the board indices.

It has been confirmed by prior studies (e.g., Ritter, 1991; Loughran and Ritter, 1995; Gompers and Lerner, 2003) that the long run performance measure is sensitive to the benchmark employed. Apart from reporting the returns on IPO companies relative to the returns on matching companies of the same market capitalisation, the present study also reports mean raw returns, buy-and-hold abnormal returns and wealth relatives using the Malaysian main market indices (KL Composite Index) and board indices (EMAS/Second Board Index).

With regard to the alternative market benchmarks, Table 6.9 reveals the absence of any underperformance over the three year period, irrespective of the market benchmarks employed when *BHAR*s are calculated using the equally-weighted weighting scheme.

Rather, Panel B shows *over*performance with equally-weighted mean one-, two-, and three-year *BHAR*s when the KL Composite Index is used as the market benchmark of 11.61%, 21.10%, and 17.86%, respectively, statistically significant at the 1% level. However, when the value-weighted scheme is employed, the three-year mean *BHAR*s are significantly negative.

Table 6.9 Mean one-, two-, and three-year raw returns, buy-and-hold abnormal returns and wealth relatives using alternative market benchmarks

	Equal-weighted			Value-weighted		
	1-year	2-year	3-year	1-year	2-year	3-year
Panel A: Mean raw buy-and-hold returns (%)						
IPO company	12.50	33.59	34.74	5.36	23.17	25.64
KL Composite Index	0.89	12.49	16.88	3.61	19.29	39.87
EMAS/Second Board Index	3.63	17.84	19.88	5.11	19.86	39.60
Panel B: Mean buy-and-hold abnormal returns (%)						
KL Composite Index-adjusted	11.61	21.10	17.86	1.74	3.88	-14.23
t-statistics	3.88[a]	3.64[a]	2.88[a]	0.59	0.67	-2.30[b]
Bootstrapped skewness-adjusted *t*-statistics	4.57[a]	4.93[a]	3.60[a]	0.63	0.76	-1.76[c]
EMAS/Second Board Index-adjusted	8.87	15.75	14.86	0.25	3.30	-13.96
t-statistics	3.43[a]	3.07[a]	2.78[a]	0.10	0.65	-2.61[a]
Bootstrapped skewness-adjusted *t*-statistics	3.98[a]	4.17[a]	3.54[a]	0.12	0.75	-1.84[c]
Panel C: Wealth relatives						
KL Composite Index-adjusted	1.11	1.19	1.15	1.02	1.03	0.90
EMAS/Second Board Index-adjusted	1.09	1.13	1.12	1.00	1.03	0.90
Number of companies	454	454	435	454	454	435

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

IPO companies are also found to *over*perform when the EMAS/Second Board Indices are used as the market benchmarks. The equally-weighted mean one-, two-, and three-year *BHAR*s are found to be 8.87%, 15.75%, and 14.86% respectively, again all statistically significant at the 1% level. The *BHAR*s increase in the second year but decrease in the third year. Unsurprisingly, the wealth relatives all have a value greater than 1.00 in each of the years, reflecting the fact that the IPO companies *over*perform

both market benchmarks. However, consistent with the results reported for the KL Composite Index, adjusted using the value-weighting schemes, the mean *BHAR*s are significantly negative after three years.

Comparing the results obtained using the *CAR* and *BHAR* methods, the reported long run *over*performance of Malaysian IPOs is much lower when *BHAR*s are used. Contrary to expectations, this indicates that the *BHAR* measure imparts a downward bias in the long run, which does not support the arguments of Fama (1998), Mitchell and Stafford (2000), and Gompers and Lerner (2003) that the *BHAR* method can magnify under/*over*performance, even if it occurs only in a single period.

Due to the severe skewness[70] of the distribution of *BHAR*s, the bootstrapping method suggested by Lyon *et al.* (1999) was used to correct for this. The bootstrapped-skewness adjusted *t*-statistics are reported in Table 6.9 and show that the results of equally-weighted buy-and-hold market adjusted returns are always significant at the 1% level. However, the significance level for three-year value-weighted *BHAR*s reduces to the 10% level.

Most prior studies (and the above discussion) rely on the arithmetic mean in making inferences of long run stock market performance. However, median *BHAR*s for one-, two-, and three-years in the present study produce some conflicting results. The median equally-weighted matched company-adjusted *BHR*s for one-, two-, and three-years are

[70] The skewness of *BHAR*s for one-, two-, and three-year holding periods when the main market index (board indices) is used are all positive with a value of 2.84 (2.88), 6.04 (7.06), and 5.13 (5.81), respectively.

5.33%, 4.69%, and 1.09% respectively, but with just the one-year *BHAR*s statistically significant (at the 5% level). By contrast, the median *BHAR*s for one-, two-, and three-years for the main market index benchmark are all negative, with values of -4.20%, -13.46%, and -18.61% respectively, but with just the three-year median *BHAR*s statistically significant at the 10% level. Similarly, the median *BHAR*s using board indices as a benchmark are all negative with values of -1.49%, -2.91%, and -7.06%, but none of them are statistically significantly different.

These results based on the median suggest that IPO companies insignificantly under/*over*perform the matched companies or market benchmarks in the three year holding period. In summary, the results observed using the mean *BHAR*s should be viewed with the caveat that they are not only affected by the weighting scheme used to compute the mean abnormal returns, but are also potentially affected by the distribution of the data.[71]

6.4.2 Calendar-time approach

6.4.2.1 Fama-French (1993) three-factor time-series regressions

As a final robustness check, the calendar-time portfolio approach using the Fama and French (1993) three-factor regression was also carried out. As noted by Gompers and Lerner (2003), the three-factor regression model is 'a well-accepted method for testing

[71] Confirmation the impact of outliers was also obtained by calculating the trimmean value of *BHAR*s. The 5% trimmean value of the one-, two- and three-year KL Composite Index-adjusted *BHR*s gave the values of 6.80%, 10.03% and 7.29%, respectively. Meanwhile, the trimmean *BHAR*s using board indices as a benchmark gave the values of 5.25%, 6.71%, 6.11% over the same period, respectively. The significance level of the three year *BHARs* reduce to 10% and 5% for KL Composite Index-adjusted and EMAS/SB Index-adjusted, indicating that the results are driven by outliers.

time series significance in the pattern of the long run returns' (p. 1384). Table 6.10 reports the results of the Fama-French (1993) three-factor time-series regressions. The data for the dependent variable comprised monthly returns on IPO portfolios from July 1992 to December 2000, a total of 102 months. As indicated in Chapter 5, July 1992 is the earliest month that can be analysed due to the lack of data on the book-to-market value of equity. Monthly returns on the IPO portfolios over the preceding 36 months were regressed on R_{mt} - R_{ft}, *SMB* and *HML*. The maximum number of companies in the IPO portfolio was 201, which occurred in September 1997. The minimum number of companies was 73, which occurred in July 1992. The time-series regressions of equally-weighted and value-weighted IPO portfolios were estimated using ordinary least square (OLS) regressions (Panel A of Table 6.10) and weighted least square (WLS) regressions (Panel B of Table 6.10).[72] The intercept α from the regressions is an indicator of the risk-adjusted performance of Malaysian IPOs. The results are reported for situations where the *SMB* and *HML* portfolios are purged, and are not purged, of IPO companies that went public during the previous three years.

Focusing first on Panel A, when the *SMB* and *HML* portfolios are not purged of IPO companies that went public in the previous three years, the mean alpha for the Fama and French (1993) three-factor model is 0.325% per month when equal-weighting is used. This implies a three-year abnormal return of –11.70% (-0.325 x 36 months). However, the *t*-statistic of –0.68 indicates that the mean monthly abnormal return is not statistically significant. When the IPO portfolios are value-weighted (Column 3 of

[72] White's heteroscedasticity tests have been performed for all regressions. All of the regressions are free from the heteroscedasticity problem except when purged *SMB* and *HML* portfolio are used under equally-weighted IPO portfolios. Therefore, the reported *t*-statistics are adjusted for heteroscedasticity (White's correction).

Panel A) they *over*perform by 32.7 basis points per month, implying a positive three-year excess return of 11.78% (0.327 x 36 months). Once again, however, the *t*-statistic of 0.81 indicates that this abnormal return is not statistically significant. In Columns 4 and 5 of Table 6.10, the results of similar regressions are reported, where the *SMB* and *HML* portfolios were constructed after the deletion of all companies that had made IPOs during the prior three years. The alphas for the equally-weighted and value-weighted portfolios are -0.431% and 0.239%, respectively. As before, the low reported *t*-statistics indicate that the alphas are not statistically significant.

Table 6.10 Fama-French (1993) three-factor time-series regressions

$$R_{pt} - R_{ft} = \alpha + \beta(R_{mt} - R_{ft}) + \gamma SMB_t + \delta HML_t + \varepsilon_t$$

	HML and *SMB* portfolios are not purged of IPO companies		*HML* and *SMB* portfolios are purged of IPO companies	
	Equally-weighted	Value-weighted	Equally-weighted	Value-weighted
Panel A: Ordinary least squares regression				
α	-0.003 (-0.68)	0.003 (0.81)	-0.004 (-0.79)	0.002 (0.52)
β	0.784 (13.34)[a]	0.772 (15.44)[a]	0.808 (10.79)[a]	0.794 (13.71)[a]
γ	0.886 (13.30)[a]	0.683 (13.90)[a]	0.831 (8.46)[a]	0.638 (9.53)[a]
δ	0.093 (0.93)	-0.015 (-0.15)	0.187 (1.64)	0.054 (0.51)
Adjusted R^2	0.889	0.892	0.859	0.860
Panel B: Weighted least squares regression				
α	-0.005 (-1.04)	0.004 (1.10)	-0.006 (-1.08)	0.004 (0.76)
β	0.802 (15.92)[a]	0.768 (15.32)[a]	0.836 (12.86)[a]	0.794 (14.14)[a]
γ	0.945 (16.04)[a]	0.715 (16.17)[a]	0.919 (10.93)[a]	0.690 (12.23)[a]
δ	0.049 (0.57)	-0.002 (-0.01)	0.123 (1.33)	0.061 (0.67)
Adjusted R^2	0.919	0.910	0.890	0.882

Note:

[a] Significantly different from zero at the 0.01 level, using a two-tailed test.

The *t*-statistics given in brackets were adjusted for heteroscedasticity (White's correction).

Due to the fact that the Fama-French approach weights each month equally, any underperformance will be reduced if it is correlated with the number of IPOs in the portfolios (Gompers and Lerner, 2003). Following the approach adopted by Gompers and Lerner (2003), the present study also ran weighted least squares regressions, the results of which are reported in Panel B of Table 6.10. The square root of the number of IPOs in the IPO portfolios in each month was used as the weight. Consistent with the OLS regression results, the intercepts are negative when equally-weighted IPO portfolios are used in both unpurged and purged regressions. On the other hand, the intercepts are positive when value-weighted IPO portfolios are used in both unpurged and purged regressions. However, the low *t*-statistics of the intercepts reported in all of the regressions indicate that they are not significantly different from zero. These results are in contrast with those obtained using the value-weighting scheme employed in the event-time approach. One of the reasons for this is that, under the event-time approach the weight is calculated using the market value at the time of listing, whereas under the calendar-time approach the weight is based on the market value in each calendar month.

In summary, it can be concluded that the use of calendar-time analysis does not permit the conclusion that Malaysian IPOs produce significant (either positive or negative) abnormal returns.

6.5 Cross-sectional pattern of long run stock market performance

This section presents the cross-sectional pattern of long run stock market performance by categorising the sample companies based on their year of listing on the KLSE, industrial sector classification, board of listing, market capitalisation, type of company (either private or PIPO), gross proceeds raised from the IPO, and initial returns. By

breaking down the sample in this way, the source of variation in the underperformance of IPOs due to a company's specific characteristics and broad economic characteristics may be traced (Page and Reyneke, 1997). Due to the fact that the results of equally-weighted and value-weighted *BHAR*s using size-matched companies do not differ very much, the present study reports only the results of the cross-sectional analyses, based on equally-weighted *BHAR*s.

6.5.1 Long run performance categorised by calendar year

Table 6.11 reports the equally-weighted mean three-year buy-and-hold abnormal returns (*BHAR*s) for Malaysian IPO companies listed over the period 1990-2000, categorised by year of listing. Column 2 of Table 6.11 provides the number of IPOs taking place each year. Column 3 and Column 4 report the raw buy-and-hold returns on the IPO companies and their matched companies, respectively. The *BHAR*s are reported in Column 5, calculated as the difference between the raw returns on the IPO companies and the raw returns on the matched companies. The paired *t*-test is used to test for any significant difference between the mean buy-and-hold returns of IPO companies and their matched companies for each category. The table also reports the corresponding wealth relatives in Column 7, and the fraction of IPO companies underperforming their matched companies in Column 8. The binomial proportionality test statistic in Column 9 is used to test whether the fraction of IPO companies underperforming is significantly different from 0.5.

It is evident from Table 6.11 that poor abnormal performance occurred for IPOs taking place in the years 1990, 1991, 1992, 1996, 1998, and 2000. Conversely, companies listed in the years 1993, 1994, 1995, 1997, and 1999 produced positive abnormal

returns. However, the poor performance of companies listed in the years 1991, 1992 and 1998 are only weakly significant at the 10% level. Interestingly, companies listed in the years 1994 and 1995 produce statistically significant *over*performance at the 5% level, which corresponds to an economic boom period in Malaysia. The two years also produce high wealth relatives, of 1.39 and 1.49, respectively. The fraction of companies underperforming in each of these two years is very low and both fractions are significantly different from 0.5 at the 1% level, as shown by the *z*-statistics produced by the binomial proportionality test. Further analysis based on an ANOVA test shows that at least one of the years is significantly different from the rest (p-value = 0.011).

Table 6.11 Long run performance categorised by calendar year

Year	Number of IPOs	IPO *BHRs* (%)	Matched company *BHRs* (%)	*BHARs** (%)	Paired *t*-test stat	Wealth relatives	Fraction under performing	*z*-stat
1990	25	133.69	135.93	-2.24	-0.05	0.99	0.36	-1.40
1991	27	183.17	270.29	-87.12	-1.75[c]	0.76	0.63	1.35
1992	33	139.75	212.38	-72.63	-1.83[c]	0.77	0.67	1.95[f]
1993	37	209.16	185.83	23.33	0.46	1.08	0.43	-0.85
1994	54	54.30	11.07	43.23	2.43[b]	1.39	0.26	-3.53[d]
1995	41	-29.95	-52.89	22.94	1.81[b]	1.49	0.29	-2.69[d]
1996	76	-63.59	-61.54	-2.05	-0.71	0.95	0.61	1.92[f]
1997	77	-27.98	-37.28	9.30	1.37	1.15	0.48	-0.35
1998	27	-0.64	31.37	-32.01	-1.84[c]	0.76	0.67	1.77[f]
1999	19	13.13	1.60	11.53	0.72	1.11	0.53	0.26
2000	17	-42.80	-35.71	-7.09	-0.37	0.89	0.53	0.25
All	433	34.32	36.33	-2.01	-0.27	0.99	0.48	0.83

Note:

[a, b,and c] Significant difference in returns between IPO and matching companies at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

[d, e, and f] Significantly different from 0.5 at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

* Oneway ANOVA test for mean differences for all years (F = 2.34, p-value = 0.011).

Overall, the results show that underperformance is not concentrated in years when there are large numbers of IPOs, in contrast to the finding of Loughran and Ritter (1995), who found that high underperformance existed in 'hot issue' periods. On the other hand, the years when there are smaller numbers of IPOs tend to produce underperformance, and

vice versa. Although Table 6.11 reports significant *over*/underperformance in particular years, there is no significant *over*/underperformance for the overall sample period.

6.5.2 Long run performance categorised by company characteristics

Panel A of Table 6.12 categorises IPO companies at the time of listing by 'sector' groups based on the KLSE sectoral classification. Inspection of Table 6.12 reveals a wide variation in the long run performance of IPOs across sectors. IPO companies classified under the Construction sector produced a mean three-year *BHAR* of 36.28%. With a paired *t*-statistic of 1.78, the *over*performance is weakly significant at the 10% level. The *over*performance in this sector is reflected in the high wealth relative of 1.25, and also in the low fraction of IPO companies' returns which underperformed their matched companies' returns, reported at only 27%. This fraction is significantly different from 0.5 at the 1% level. The Consumer Products sector, the Industrial Products sector, and the Properties sector all show underperformance in the long run, but the degree of underperformance is not statistically significant. The evidence from Panel A of Table 6.12 indicates that the long run underperformance is not entirely concentrated in particular sectors. The results are confirmed by performing an ANOVA test, which indicates that none of the sectors has a statistically significant mean *BHAR* from the others (F = 903, p-value = 0.493).

The long run performance of Malaysian IPOs is also categorised by their board of listing at the time of issue. As exhibited in Panel B of Table 6.12, the IPO companies that are listed on the Main Board of the KLSE slightly underperformed their matched companies by 7.54%. However, the difference between the three-year *BHR*s of IPO companies and their matched companies is not statistically significant. The

underperformance of IPO companies listed on the Main Board is confirmed by the wealth relative measure of 0.94, indicating that the IPO companies listed on the Main Board of the KLSE underperformed their matched company benchmarks.

Table 6.12 Long run performance categorised by company characteristics (sector, board of listing, size, and type of company)

Sector/Board of listing/Size	Number of IPOs	IPO *BHR*s (%)	Matched company *BHR*s (%)	*BHAR*s (%)	Paired *t*-test stat	Wealth relatives	Fraction under performing	*z*-stat
Panel A: Sector								
Construction	48	83.92	47.64	36.28	1.78[c]	1.25	0.27	-3.19[d]
Consumer Products	78	16.23	24.10	-7.87	-0.60	0.94	0.47	-0.53
Industrial Products	173	12.76	25.86	-13.10	-1.36	0.90	0.53	0.79
Properties	28	32.34	40.44	-8.10	-0.23	0.94	0.57	0.74
Trading/Services	94	55.56	55.75	-0.19	-0.01	1.00	0.47	-0.58
All Other Sectors	12	102.65	59.93	42.72	1.19	1.27	0.50	0.00
Panel B: Board of listing								
Main Board	131	26.28	33.82	-7.54	-0.63	0.94	0.47	-0.61
Second Board	302	37.81	37.42	0.39	0.04	1.00	0.48	-0.69
Panel C: Size								
Small	130	110.51	108.11	2.40	0.12	1.01	0.45	-1.14
Medium	173	21.38	17.99	3.39	0.35	1.03	0.43	-1.84[f]
Large	130	-24.65	-11.04	-13.61	-1.56	0.85	0.56	1.37
Panel D: Type of company								
Private	416	35.92	38.55	-2.64	-0.34	0.98	0.48	-0.98
Privatisation	17	-4.76	-18.02	13.26	1.02	1.16	0.53	0.24
All	433	34.32	36.33	-2.01	-0.27	0.99	0.48	0.83

Note:

[a, b, and c] Significant difference in returns between IPO and matching companies at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

[d, e, and f] Significantly different from 0.5 at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test. The binomial proportionality test statistic is used to test whether the fraction underperforming is significantly different from 0.5.

The IPO companies listed on the Second Board of the KLSE produced a slight *over*performance (0.39%), indicating that large IPO companies perform less well than small IPO companies, which is consistent with the results observed when the value-weighting scheme is employed for calculating both *CAR*s and *BHAR*s. The wealth relative is 1.00, indicating that both IPO companies and their matched companies produced similar returns in the long run. The insignificant results reported for the paired *t*-test statistics and the binomial proportionality test statistics indicate that

there is no difference in mean *BHAR*s between IPO companies and their matched companies for each board of listing. The p-value of 0.630 (*t*-stat = -0.483) obtained from the two independent sample test indicates that there is an insignificant difference between the mean *BHAR*s for the two groups.

Panel C of Table 6.12 presents the long run performance categorised by company size, measured by market value on the first day of listing. The samples were classified into three sizes groups: small, medium, and large. To allocate companies into groups, the market values were first sorted from low to high. Thirty percent of the sample companies from the bottom were grouped as the small size set, 40% in the middle were considered to be the medium size group, while the top 30% were considered to be the large size one. The small size group comprised those IPO companies with a market value of less than RM102.55 million. The medium size consisted of those IPO companies with a market value between RM102.55 million and RM260.85 million, while the large size comprised those IPO companies with a market value in excess of RM264.85 million.

As seen in Panel C of Table 6.12, the buy-and-hold return for IPO companies in the small size group was 110.51% and for matched companies was 108.11%. On the other hand, the buy-and-hold returns for IPOs and their matched companies in the large size groups were -24.65% and -11.04%, respectively. The low paired *t*-statistic for each size group indicates that there are no significant differences in mean *BHR*s between issuing companies and matched companies. Further analysis based on an ANOVA test shows insignificant differences (F = 0.509, p-value = 0.602) among the three size groups. The wealth relatives of 1.01 and 1.03 for the small and medium size groups indicates that the IPO companies *over*performed their matched companies in both groups, while the

wealth relative of 0.85 in the large size one indicates that these IPO companies underperformed their matched companies. The proportion underperforming is not statistically significant for the small and large size groups but is weakly significant (10% level) for the medium size one. These results confirm the earlier findings of low *CAR*s and *BHAR*s when the value-weighting scheme is employed, indicating that small companies perform better than large companies. However, the results of the present study are in contrast to the results observed by Khurshed *et al.* (1999) on the UK market. As can be seen in Table 6.12, the number of IPOs contained in the large size group category (130) and in the Main Board listing category (131) are almost identical. However, only 92 of the companies in the large size group are listed on the Main Board of the KLSE, while 38 of these companies are listed on the Second Board. The mean buy-and-hold returns for companies listed on the Main Board are thus different from the returns of companies in the large size group.

Panel D of Table 6.12 reports the long run performance classified according to types of IPO company, either private or privatisation IPOs. As shown in Panel D, the private IPO companies slightly underperform their matched companies but the privatisation IPO companies *over*perform their matched companies, with three-year *BHAR*s of -2.64% and 13.26%, respectively. However, the difference between the three-year *BHR*s of IPO companies and their matched companies in each group is not statistically significant. Further analysis based on a two sample *t*-test shows an insignificant difference (*t*-stat = -0.41) between the three-year mean *BHAR*s of private IPOs and privatisation IPOs. The results of the present study contrast with those observed by Paudyal *et al.* (1998), who reported that Malaysian PIPOs generate an insignificant loss of 7.46% over a three-year period after adjusting for the market benchmark. On the other hand, they reported that Malaysian private IPOs generate an insignificant gain of

12.85% over the same period. However, the difference between PIPOs and private IPOs was statistically insignificant, consistent with the present study.

6.5.3 Long run performance categorised by issue characteristics

In Panel A of Table 6.13, companies are segmented by the gross proceeds raised by the offers, expressed in constant 2002 RM, by adjusting for the Consumer Price Index. In Column 1 the gross proceeds are broken down into six categories, five of which display long run underperformance. IPOs in the lowest gross proceeds category *over*perform, with a statistically significant mean *BHAR* of 57.73%. The wealth relative of 1.41 reported in Column 7 indicates that these IPO companies *over*perform their matched companies by 41%. The fraction of IPOs underperforming in the lowest gross proceeds category is 39%, which is significantly different from 0.5 at the 10% level. Examination of Panel A of Table 6.13 also reveals that the long run underperformance is concentrated among those IPOs which raise higher gross proceeds. This is also confirmed by the ANOVA test (F = 3.382, p-value = 0.005), indicating that at least one of the gross proceeds groups has a significantly different mean *BHAR* from the others.

Finally, the results are categorised by the magnitude of the raw initial returns. The initial returns are divided into three groups: low, medium and high. To create the groups, the initial raw returns are ranked from lowest to highest. The lowest 30% of the sample companies are categorised as the 'low' initial returns group, the 40% in the middle are categorised as the 'medium' initial returns group, while the top 30% are classified as the 'high' initial returns group. The low initial returns group comprised those IPO companies with a raw initial return of less than 41%. The medium initial returns group consisted of those IPO companies with a raw initial return of between

41% and 125%. The high initial returns group consisted of those IPO companies with a raw initial return in excess of 125%.

Table 6.13 Long run performance categorised by issue characteristics (gross proceeds and initial returns)

	Number of IPOs	IPO *BHRs* (%)	Matched company *BHRs* (%)	*BHARs* (%)	Paired *t*-test stat	Wealth relatives	Fraction under performing	*z*-stat
Panel A: Gross proceeds (in million RM)								
4.3 – 9.9	79	100.04	42.31	57.73	2.42[b]	1.41	0.39	-1.96[f]
10.0 – 19.9	154	24.07	32.51	-8.44	-0.90	0.94	0.46	-0.99
20.0 – 29.9	80	37.75	75.18	-37.43	-1.76[c]	0.79	0.53	0.54
30.0 – 49.9	62	11.18	12.66	-1.48	-0.08	0.99	0.47	-0.47
50.0 – 99.9	37	-10.53	10.57	-21.10	-1.19	0.81	0.57	0.85
100.0 – 523.8	21	-3.44	9.16	-12.60	-0.68	0.88	0.62	1.10
Panel B: Initial returns (%)								
Low	130	81.87	111.23	-29.36	-1.90[c]	0.86	0.52	0.46
Medium	173	44.40	37.36	7.04	0.60	1.05	0.46	-1.05
High	130	-26.65	-39.93	13.28	1.11	1.22	0.45	-1.14
All	433	34.32	36.33	-2.01	-0.27	0.99	0.48	0.83

Note:

[a, b, and c] Significant difference in returns between IPO and matching companies at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

[d, e, and f] Significantly different from 0.5 at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

The results in Column 5 of Panel B show an inverse relationship between initial returns and subsequent raw returns, but a positive relationship with buy-and-hold abnormal returns. The low initial return group has a negative mean *BHAR* of 29.36%, whereas the high initial return group has a positive mean *BHAR* of 13.28%. This evidence does not support the fad hypothesis of Ritter (1991) or the overreaction hypothesis of De Bondt and Thaler (1985, 1987), who suggest a negative relationship between past returns and subsequent abnormal returns.[73] The poor long run performance of the low initial

[73] However, unreported results based on market, rather than matched company, benchmarks show that IPO companies in the higher initial returns group actually underperform, while those in low initial returns group *over*perform; this result is consistent with the findings of Paudyal *et al.* (1998) for the Malaysian market.

returns group is reflected in a low wealth relative measure (0.86). The fraction of these IPO companies that had *BHAR*s less than their matched companies is 52%. However, the number of companies underperforming in all three of the initial returns group is not statistically significant. Further analysis based on the ANOVA test shows that at least one of the initial return groups has significantly different (at the 10% level) mean *BHAR*s from the rest of the initial return groups.

6.6 Summary

This chapter reports the results of the analyses of stock market performance. Two types of analyses on long run share price performance were carried out, based on the event-time and calendar-time approaches. Cross-sectional analyses of long run performance were also carried out. Long run performance is broken down by year of listing, sector, board of listing, size, private or privatisation IPOs, gross proceeds, and initial returns.

The results of the initial returns are consistent with existing international evidence and also consistent with prior results found in Malaysia. However, the results concerning long run returns are contrary to the results typically found in developed markets and are dependent upon the methods used. The present study finds significant *over*performance when event-time *CAR*s and *BHR*s are calculated using both market benchmarks and the equal-weighting scheme, except when matched companies are used as the benchmark. However, the significant *over*performance disappears when the value-weighting scheme is employed for both of the return measures. In addition, the significant abnormal performance also disappears when the Fama-French (1993) three-factor regressions are used, confirming the argument of Gompers and Lerner (2003) that the relative

performance of an IPO sample depends on the method used to examine performance. Ritter and Welch (2002) and Ritter (2003) argue that the characteristics of an IPO sample, in terms of the time period and the selection criteria, also contribute to the observed differences in the findings of studies on the long run performance of IPOs. In a nutshell, the results of the present study suggest that investors who measure their investment in IPO companies using the event-time approach will conclude that they earn positive returns in the long run, but if they employed the calendar-time approach they would conclude that do not gain any abnormal returns.

Segmenting the sample by year of listing and comparing long run performance using size-matched companies reveals that the IPO performance varies from year to year, and does not appear to be related in any systematic fashion to years when there were large numbers of IPOs. The long run performance does not significantly differ across sectors, and there is also no significant difference between the performance of IPOs listed on the Main Board and the Second Board of the KLSE. Private IPOs produce insignificant underperformance, while privatisations IPOs produce insignificant *over*performance over the three-year period. An investment of large IPO companies produces greater negative returns compared to matching companies of a similar size. In addition, while IPOs with low initial returns provide high raw returns in the long run, they underperform their matched companies. Finally, IPOs with the smallest gross proceeds achieve significant *over*performance over the three-year horizon.

The following chapter provides a review of the empirical evidence concerning accounting-based IPO operating performance.

Chapter 7

Review of empirical studies and research hypotheses: Accounting-based operating performance

7.1 Introduction

The empirical evidence on the stock market performance of new equity issues was reviewed in Chapter 4. In general, the evidence reveals that the stock market performance is poor in the post-IPO period. Studies using accounting data have been employed to ascertain if there is also a deterioration in operating performance following IPOs. This chapter provides a review of empirical studies which focus on pre- and post-IPO accounting performance, and then proceeds to develop testable hypotheses concerning accounting-based operating performance of IPOs.

While the focus of this study is to investigate the accounting performance of IPO companies, the first part of this chapter also reviews empirical evidence on companies making seasoned equity offerings (SEO). Since the SEO occurs after the IPO to raise additional equity capital, a similar trend of long run performance may be expected for companies conducting SEOs. The second part of this chapter provides the hypotheses related to accounting performance.

7.2 Review of empirical studies on accounting-based operating performance

Similar to the stock market performance literature, there are two strands of related literature on accounting-based operating performance of IPO companies. The first

focuses on IPOs in the private sector and the second on privatisation share issues (PIPOs).

7.2.1 Prior studies on IPOs in general

Relatively few studies have focused on the accounting-based operating performance of IPOs. The long run underperformance results found in stock price (market-based) studies have been confirmed by several studies on the long run operating (accounting-based) performance; including Jain and Kini (1994, 1995), Cai and Wei (1997), Mikkelson, Partch and Shah (1997), Pagano, Panetta and Zingales (1998), Kutsuna, Okamura and Cowling (2002), Chan, Wang and Wei (2003), Khurshed, Paleari and Vismara (2003), Balatbat *et al.* (2004), Coakley, Hadass and Wood (2004), Kim *et al.* (2004), and Wang (2005).

The first study that examines the operating performance of IPO companies is undertaken by Jain and Kini (1994). They analyse the change in operating performance of 682 IPOs in the US for the period 1976 to 1988. They measure performance primarily by operating returns on assets (accrual-based) and operating cash flow deflated by assets (cash flow-based). They find a significant decline in both operating performance measures for a period of three to five years subsequent to the IPO relative to the one-year pre-IPO level performance, both before and after industry adjustment. However, operating cash flow is calculated as operating income minus capital expenditure, which has been argued to be a poor proxy (Bowen *et al.*, 1986).[74] They

[74] Bowen *et al.* (1986) define five measure of cash flows (CF): (i) NIDPR = net income before extraordinary items and discontinued operations (NIBEI) + depreciation and amortization (DPR); (ii) WCFO = NIDPR + adjustments for 'other' elements of NIBEI not affecting working capital; (iii) CFO = WCFO – change in noncash current assets from operations + change in current liabilities from operations;

argue that the declining operating performance in the post-IPO period cannot be attributed to a decline in business activity such as lack of growth in sales or cutbacks in post-IPO capital expenditure. This is because they also find that their sample of IPO companies displayed strong growth in sales and capital expenditure following the IPOs. Similar results are also found by Chan *et al.* (2003) for Chinese IPOs.

Jain and Kini (1994) also analyse the relationship between underpricing and long run operating performance to test whether, consistent with the signalling model of underpricing, companies with larger underpricing provide superior post-IPO operating performance; however, they find no evidence of this. Finally, they investigate the relationship between retained ownership at the time of the IPOs and long run post-IPO performance to see whether equity retention by original shareholders can act as a signal of company value, the idea being that owners will retain high ownership if they expect high future cash flow relative to present company value. Using a dichotomous split between low and high ownership, they find a positive relationship between post-IPO operating performance and equity retention, both before and after adjustment for industry effects. This supports the agency cost hypothesis of Jensen and Meckling (1976), in which high managerial retained ownership reduces incentives to undertake non-value maximising projects.

Jain and Kini (1994) then examine market expectations and earnings performance to discover if investors valued the IPO company based on an expectation that earnings

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(iv) CFAI = CFO + proceeds from the sale of property, plant, and equipment + proceed from sale of investments + amount of capital expenditures during the period + increase in investments in other corporations during the period; (v) CC = CFAI + net financing activity for the period. They suggest that the traditional measures of CF (i) and (ii) are inferior proxies to the alternative measures of CF incorporating additional adjustments (p. 715-719).

growth will continue. The three measures (the market-to-book ratio, the price/earnings (P/E) ratio and earnings per share) all decline after the IPOs. The high pre-IPO values implied that investors have expectations of high earnings growth in the future, but the lower post-IPO values show that the expectations are not realised. They suggest several possible explanations: (i) the agency problem described by Jensen and Meckling (1976); (ii) window-dressing of pre-IPO performance; and (iii) managers timing their issues to follow periods of extraordinarily good performance.

Jain and Kini (1995) have undertaken a similar study but focus on potential differentials between venture-backed and nonventure-backed IPOs. They also find a significant decline for both groups relative to the pre-IPO levels but the decline is significantly higher for nonventure-backed IPOs. Their study has been replicated using UK data by a working paper of Coakley *et al.* (2004). Contrary to the Jain and Kini (1995) findings, they demonstrate that the operating performance differential between venture-backed and nonventure backed IPOs is not significant for a UK sample.

Another study by Mikkelson *et al.* (1997) examines the operating performance up to ten years after going public of 283 US IPOs in the years 1980 to 1983. They matched IPO companies with non-issuing companies based on industry, industry and size (book value of assets), and industry and performance (level of operating return on asset or return on sales). They find that operating performance of IPOs is higher than that of the matched companies pre-IPO but lower post-IPO. However, significant changes in operating performance are confined to the period surrounding the offerings (from year -1 to year +1). There is no further significant decline in relative performance of the IPO companies through the following ten years of public trading. In contrast to Jain and Kini (1994), Mikkelson *et al.* (1997) do not find a relationship between operating

performance and various measures of ownership interest. However, secondary sales by current shareholders, and the size and age of IPO companies, do help to explain the variation in operating performance.

Cai and Wei (1997) study the long run operating performance for -5 and +5 year windows for 180 IPOs listed on the Tokyo Stock Exchange during the period 1971 to 1992. They find a significant pre-issue rise and post-issue decline in operating performance of Japanese IPO companies after adjustment for industry and mean-reversion trends. Like Jain and Kini (1994), they also use a poor proxy to measure cash flows, as argued by Bowen *et al.* (1986). In contrast to the evidence observed by Jain and Kini (1994) for the US market, they find that the post issue deterioration in operating performance is not related to changes in the ownership structure. However, Kutsuna *et al.* (2002), who examine the same market, find contrasting evidence to that reported by Cai and Wei (1997), supporting the hypothesis that the post-IPO deterioration in operating performance is partly attributable to reduced managerial ownership.

Teoh *et al.* (1998a), while mainly focusing on earnings management and long run share price performance in the US, also provide evidence on the time-series distribution of accounting performance measured by net income and cash flow from operations divided by lagged total assets. They find that the median return on assets is significantly positive in year 0 but then declines, to be significantly negative, by year four. In contrast to the accrual measure, cash flow return on assets began poorly in the issuance year and monotonically improved through year six. In a similar study of 64 Dutch IPOs, Roosenboom *et al.* (2003) find that the decline in cash flow return on assets from

year -1 to 0 is much higher than the decline in return on assets. Their results seem to contradict the results observed by Teoh *et al.* (1998a).

Shelor and Anderson (1998) study changes in operating performance among real estate investment trusts (REITs) during the year immediately before and two years following an IPO. Using operating return on assets and other performance measures (net return on total assets, asset turnover ratio, and operating return on sales), they find that post-IPO performance measures increase significantly, in contrast to prior results for non-financial companies. However, Shelor and Anderson (1998) do not compare the performance to other benchmarks such as seasoned REITs companies. Therefore, their results could be influenced by a common factor which improves profitability in the REIT industry rather than by REITs companies which engaged in IPOs.

It would appear that the first study examining the operating performance of IPO companies for the UK market is a working paper by Khurshed *et al.* (2003), covering the period 1995 to 1999. Their study basically replicates the analysis of Jain and Kini (1994) using data from the UK market. They examine the median level and changes from the year before the IPO to the year of the IPO and for each of the subsequent three years. They find evidence of a significant decline in operating performance of UK IPO companies in the three years following IPOs, both before and after industry adjustment. However, the companies show a strong growth in the level of assets, earnings and net cash flows following the IPOs. The authors suggest that the UK corporate culture may be too focused on growth.

Consistent with Jain and Kini (1994), Khurshed *et al.* (2003) do not find any relationship between initial underpricing and long run operating performance, a result

which does not support the signalling theory of underpricing. They also investigate the level of market ratios and find some evidence of decline in their levels subsequent to the IPOs, suggesting that investors may have had systematically biased expectations of earnings growth in the post-IPO period.

In a more recent study, Kim *et al.* (2004) examine the operating performance of 133 IPOs in Thailand during the period 1987 to 1993. They find that both accrual- and cash flow-based performance measures decline after the companies have gone public, both before and after industry adjustments. The cash flow measure is computed as earnings before interest and tax plus depreciation, which is also argued to be a poor proxy by Bowen *et al.* (1986). Like Jain and Kini (1994) and Chan *et al.* (2003), Kim *et al.* (2004) investigate the source of IPO underperformance by looking at the sales growth, asset turnover, and capital expenditure measures. They find that sales significantly increase over the four years after the IPOs. However, both asset turnover and capital expenditure appear to decline during the post-IPO period. They suggest that the changes in sales and capital expenditure levels do not fully explain the inferior post-IPO operating performance.

Kim *et al.* (2004) further examine the relationship between managerial ownership and operating performance. Using regression analysis, they find a curvilinear relationship between managerial ownership and the post IPO change in performance. In particular, there is a positive relationship between managerial ownership and the change in performance for companies with 'low' and 'high' levels of managerial ownership, which supports the alignment of interests hypothesis of Jensen and Meckling (1976). However, they find a negative relationship for 'intermediate' levels, consistent with the entrenchment hypothesis of Fama and Jensen (1983), which argues that managers may

not maximise shareholders' wealth when they retain more shares after the IPO. They note that this nonlinear relationship may explain the conflict between the findings of Jain and Kini (1994) and Mikkelson *et al.* (1997). Contrary to Jain and Kini (1994), Kim *et al.*'s (2004) results are consistent with Mikkelson *et al.* (1997), who also fail to find any relationship between managerial ownership and company performance when Kim *et al.* (2004) use both the level of ownership variable and an ownership-squared variable as an explanatory variable for the change in performance. However, the relationship is only captured when Kim *et al.* (2004) allow for three levels of inside ownership.

In summary, all of the studies find that both operating performance measures (accrual and cash flow) decline in the post-IPO period. However, the degree of deterioration in performance based on accrual- and cash flow-based measures is variable. For example, Cai and Wei (1997) find a significantly higher decline in accrual than in cash flow but Chan *et al.* (2003) find similar falls in both measures. This empirical evidence is largely based upon studies of companies in developed markets. There is no published study to date that has examined the accounting-based operating performance of Malaysian IPOs using both approaches. The cash flow-based measure used by Jain and Kini (1994), Cai and Wei (1997), Chan *et al.* (2003), Coakley *et al.* (2004), and Kim *et al.* (2004) is proxied by operating income minus capital expenditure, or by EBIT plus depreciation. Even though these studies test the robustness of their results using the cash flow-based approach, which is less vulnerable to accounting manipulation, they do not use an 'improved' measure of cash flows that incorporates additional adjustments as suggested by Bowen *et al.* (1986).

Table 7.1 summarises the previous empirical studies on accounting-based operating performance employing accrual- and cash flow-based approaches. The table also identifies the performance measure and benchmark used in each study.

Table 7.1 A summary study of operating performance of IPO employing accrual- and cash flow-based approaches

Study/Publication date/Sample size/ Sample period/ Country examined	Performance window	Approach	Benchmark	Main operating performance measure		Findings
Jain and Kini (1994) 682 IPOs 1976-1988 US	-1 to +5	Accrual-based	Industry median	OI/TA*	Operating income (before depreciation and taxes) divided by total assets.	A significant decline in post-IPO operating performance using both approaches.
		Cash flow-based		OCF/TA^	Operating income minus capital expenditure divided by total assets.	
Jain and Kini (1995) 272 IPOs (136-Venture-backed, 136-Nonventure-backed) 1976-1988 US	-1 to +3	Accrual-based	Industry and size	OI/TA	Operating income (before depreciation and taxes) divided by total assets.	A significant decline in post-IPO operating performance using both approaches.
		Cash flow-based		OCF/TA	Operating income minus capital expenditure divided by total assets.	
Cai and Wei (1997) 180 IPOs 1971-1992 Japan	-5 to +5	Accrual-based	Industry median	OI/TA	Net sales - (Cost of sales, selling, general and administrative expenses, and depreciation) + interest income - interest expense) before taxes divided by total assets.	A significant increase before the IPO but significant decline in post-IPO accrual-based operating performance.
			Industry and pre-operating performance	- .		
		Cash flow-based		OCF/TA	Operating income minus capital expenditure divided by total assets.	*Ins*ignificant increase before the IPO but significant decline in post-IPO cash flow-based operating performance.
Mikkelson *et al.* (1997) 283 IPOs 1980-1983 US	-1 to +10	Accrual-based	Industry-matched company	OI/TA	Operating income before deducting depreciation, interest, taxes, and extraordinary items divided by assets.	A significant decline from the year before the offerings to the end of first year of public trading, but performance declines no further in ten years.
			Industry and size			
			Industry and pre-operating performance	OI/Sales#	Operating income before depreciation, interest, taxes, and extraordinary items divided by sales.	

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Table 7.1 (*continued*) A summary study of operating performance of IPO employing accrual- and cash flow-based approaches

Study/Publication date/Sample size/ Sample period/ Country examined	Performance window	Approach	Benchmark	Main operating performance measure		Findings
Pagano *et al.* (1998) 69 IPOs 1892-1992 Italy	0 to +3	Accrual-based	Unadjusted	OI/TA	EBITDA divided by total assets.	A significant decline in post-IPO operating performance.
Shelor and Anderson (1998) 76 IPOs 1976-1995 US	-1 to +2	Accrual-based	Unadjusted	OI/TA	Income before extraordinary items divided by total assets.	A significant increase in the post-IPO performance.
Teoh *et al.* (1998a) 1,649 IPOs 1980-1992 US	0 to +6	Accrual-based	Industry median	OI/TA	Net income divided lagged total assets.	Significantly positive in year 0 then declines monotonically to be significantly negative by year +4 for accrual-based performance.
		Cash flow-based		OCF/TA	Cash flow from operations divided by lagged total assets.	Significantly poor in year 0 to +3 then improve and significant in year +6 for cash flow-based performance.
Kutsuna *et al.* (2002) 247 IPOs 1995-1996 Japan	-5 to +3	Accrual-based	Industry median	OI/Sales	Ordinary profits divided by net sales. Net profits divided by net sales.	A significant decline in post-IPO operating performance.
Chan *et al.* (2003) 1993 – 1998 (570 A-Share IPOs: 1993 – 1998; 39 B-Share IPOs: 1995 – 1998) China	-1 to +3	Cash flow-based	Industry median	OCF/TA	Operating income minus capital expenditures divided by total assets.	A significant decline in post-IPO operating performance.

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Table 7.1 (*continued*) A summary study of operating performance of IPO employing accrual- and cash flow-based approaches

Study/Publication date/Sample size/ Sample period/ Country examined	Performance window	Approach	Benchmark	Main operating performance measure		Findings
Khurshed *et al.* (2003) 415 IPOs 1995 – 1999 UK	-1 to +3	Accrual-based	Industry median	OI/TA	EBITDA divided by total assets.	A significant decline in post-IPO operating performance.
Roosenboom *et al.* (2003) 64 IPOs 1984-1994 Netherlands	-2 to +3	Accrual-based	Unadjusted	NI/TA	Net income divided by lagged total assets.	A decline in post-IPO operating performance using both approaches.
		Cash flow-based		OCF/TA	Net income adjusted for changes in working capital components, noncash items and all other items for which the cash effects are investing or financing cashflows divided by lagged total assets.	
Balatbat *et al.* (2004) 313 IPOs 1976-1993 Australia	+1 to +5	Accrual-based	Industry and size-matched company	OI/TA	Profit before interest and tax divided by total assets.	A significant decline in post-IPO operating performance from the third post-listing year onwards.
Coakley *et al.* (2004) 568 IPOs (304 Venture-backed, 264 Nonventure-backed IPOs) 1985-2000 UK	-1 to +5	Accrual-based	Unadjusted	OCF/TA	Operating income minus capital expenditures divided by total assets.	A significant decline in post-IPO operating performance.

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Table 7.1 (*continued*) A summary study of operating performance of IPO employing accrual- and cash flow-based approaches

Study/Publication date/Sample size/ Sample period/ Country examined	Performance window	Approach	Benchmark	Main operating performance measure		Findings
Kim *et al.* (2004) 133 IPOs 1987-1993 Thailand	-1 to +3	Accrual-based Cash flow-based	Industry median	OI/TA OCF/TA	EBIT divided by total assets. EBIT plus depreciation divided by total assets.	A significant decline in post-IPO operating performance using both approaches.
Wang (2005) 747 PIPOs 1994-1999 China	-3 to +3	Accrual-based	Industry median	ROA[+] OI/TA S/A[++]	After-tax net income divided by total assets. Before-tax-and-interest operating income from core operating activities divided by total assets. Total sales divided by total assets.	A significant decline in post-IPO operating performance.

Note:

[*] OI/TA is operating return on total assets.

[^] OCF/TA is operating cash flow return on total assets.

[#] OI/Sales is operating return on sales.

[~] NI/TA is net income on total assets.

[+] ROS is return on assets.

[++] S/A is sales to assets.

7.2.2 Prior studies of privatisation IPOs (PIPOs)

In the early 1980s, Britain's Thatcher government introduced a privatisation programme which has now been embraced by governments of more than 100 countries (Megginson and Netter, 2001). Boycko, Shleifer, and Vishny (1996) argue that public enterprises are inefficient because they pursue strategies that satisfy political objectives rather than maximising profit. Consistent with post-PIPO efficiency improvements, studies of PIPOs generally find that companies' performance improves following public listing. Megginson, Nash and Randenborgh (1994) argue that the newly private companies are exposed to a real threat of bankruptcy due to the government no longer guaranteeing debt and covering the operating losses of state-owned enterprises. Therefore, PIPO companies are likely to pay more attention to company profitability.

Megginson and Netter (2001) survey the empirical research of 38 privatisation studies that used accounting and/or real output data to assess the effects of privatisation on operating efficiency, ownership structure, and/or financial performance. Nine out of 38 studies focus on privatisation through public share offerings.[75] They report that all of these studies offer at least limited support for the proposition that privatisation is associated with significant performance improvement of state-owned enterprises divested through public share offering.

[75] There are four methods of privatisation defined by Brada (1996) as quoted by Megginson and Netter (2001), which are: (i) privatisation through restitution; (ii) privatisation through sale of state property either in the form of direct sales or share issue privatisations; (iii) mass or voucher privatisation; and (iv) privatisation from below. Megginson and Netter (2001) provide detailed explanations of these methods on pages 339-340.

Several papers have empirically examined the operating performance of newly privatised companies, including Megginson *et al.* (1994), Boubakri and Cosset (1998), D'Souza and Megginson (1999), Aharony, Lee and Wong (2000), Bortolotti, D'Souza, Fantini and Megginson (2002), Sun and Tong (2002), Wei, Varela, D'Souza and Hassan (2003), Huang and Song (2005) and Wang (2005). The results of most of these studies are broadly similar, suggesting that performance improves following PIPOs. The three exceptions are all studies of Chinese privatisations which find profitability decline (e.g., Aharony *et al.*, 2000; Wei *et al.*, 2003; Huang and Song, 2005).

The first study on PIPOs is undertaken by Megginson *et al.* (1994). They compare the pre-and post-privatisation financial and operating performance of 61 companies from 18 countries during the period 1961 to 1990. They suggest that privatised companies perform better than their pre-privatisation counterparts. Bortolotti *et al.* (2002) report that a significant fraction of the observed improvements revealed from their own study are due to regulatory changes alone, or in combination with ownership changes, rather than from privatisation alone.

In Malaysia, the first operating performance study that focuses on PIPOs is carried out by Sun and Tong (2002), using a sample of just 24 privatised companies that listed on the KLSE during the period 1983 to 1997. In line with multi-country studies (e.g., Megginson *et al.,* 1994; Boubakri and Cosset, 1998; D'Souza and Megginson, 1999), they find that profitability, output levels, and dividend payouts improve following privatisation, but that leverage reduce. They report that the total profits of Malaysian PIPOs increase threefold, together with a doubling in real sales, increase dividend payouts and significant reductions in leverage. They argue that the privatisation programme in Malaysia is successful, but to a lesser extent than in other countries. Sun

and Tong's (2002) study is inconclusive, however, since it examines only a small sample, which is not representative of the overall population of IPOs consisting of both private and previously state-owned companies.

It is apparent that all studies examining the operating performance of privatisation IPOs have employed an accrual-based performance measure. Furthermore, most of the results (except for Boubakri and Cosset, 1999 and Huang and Song, 2005) are not robust because no adjustment was made to the privatisation sample to include matching (control) companies with similar characteristics (e.g., state-owned enterprise, similar industry, size or pre-event performance) when comparing pre- and post-PIPO performance. This control is necessary to ensure that the operating performance is related to privatisation and not to other factors apart from privatisation. For example, the results could be driven by a common decline, or by improvements, in profitability that occur within the industries to which the PIPO companies belong. Following the arguments of Megginson and Netter (2001), there is a likelihood of sample selection bias, whereby governments may tend to make their privatisations 'appear good' by privatising the healthiest companies early. In addition, several papers (e.g., Megginson *et al.,* 1994; Boubakri and Cosset, 1998; D'Souza and Megginson, 1999; Bortolotti *et al.*, 2002) which investigate privatisation for several countries may be criticised for introducing another sample selection problem. The availability of data tends to be greater in the countries which are more developed, and possibly also for companies that are performing better within developed countries. Thus, both these types of companies may be over-represented in the empirical analyses.

Table 7.2 summarises the empirical studies that examine solely privatisation IPOs. All of the studies investigate how privatisation affects company performance by comparing

pre-and post-privatisation data. The operating performance reported in the table focuses only on profitability.

Table 7.2 A summary study of operating performance changes for companies privatised through public share offerings

Study/Publication date/Sample size/ Sample period/ Country examined	Performance window	Benchmark	Main operating performance measure		Findings
Megginson *et al.* (1994) 61 PIPOs 1961-1990 18 countries	-3 to +3	Unadjusted	ROS*	Net income divided by sales.	A significant increase in post-PIPO operating performance for return on sales and return on assets measures.
			ROA^	Net income divided by total assets.	
			ROE#	Net income divided by equity.	
Boubakri and Cosset (1998) 79 PIPOs 1980-1992 21 countries	-3 to +3	Market median accounting performance	ROS	Net income divided by sales.	A significant increase in post-PIPO operating performance for return on sales and return on assets measures.
			ROA	Net income divided by total assets.	
			ROE	Net income divided by equity.	
D'Souza and Megginson (1999) 85 PIPOs 1990-1996 28 countries	-3 to +3	Unadjusted	ROS	Net income divided by sales.	A significant increase in post-PIPO operating performance for return on sales and return on assets measures.
			ROA	Net income divided by total assets.	
			ROE	Net income divided by equity.	
Aharony *et al.* (2000) 83 PIPOs 1992-1995 China	-2 to +3	Unadjusted	ROA	Net income divided by total assets.	A significant decrease in return on assets.
Bortolotti *et al.* (2002) 31 PIPOs 1981-1998 25 countries	-3 to +3	Unadjusted	OI/Sales	Operating income divided by sales.	A significant increase in post-PIPO operating performance for operating income on sales, return on sales and return on assets measures.
			ROS	Net income divided by sales.	
			ROA	Net income divided by total assets.	
			ROE	Net income divided by equity.	

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Table 7.2 ***(continued)*** **A summary study of operating performance changes for companies privatised through public share offerings**

Study/Publication date/Sample size/ Sample period/ Country examined	Performance window	Benchmark	Main operating performance measure		Findings
Sun and Tong (2002) 24 PIPOs 1983 – 1997 Malaysia	-3 to +3	Unadjusted	ROS ROA ROE	Net income divided by sales. Net income divided by total assets. Net income divided by equity.	*In*significantly increase in all post-PIPO operating performance measures.
Wei *et al.* (2003) 208 PIPOs 1990-1997 China	-3 to +3	Unadjusted	ROS Net profit level	Net income divided by sales. Net income after taxes.	Significant increase in net profit level and *in*significant decline in return on sales.
Huang and Song (2005) 44 PIPOs 1993-2000 China	-3 to +3	Size, industry, business and time of listing	ROS ROA ROE	Income before taxes, interest, and extraordinary items divided by total sales. Net income before taxes divided by total assets. Net income before taxes divided by shareholders' equity.	Significant decrease in return on assets and return on equity but *in*significant decrease in return on sales.

Note:

* ROS is return on sales.

^ ROA is return on assets.

ROE is return on equity.

7.2.3 Prior studies of seasoned equity offerings (SEOs)

Studies of the long run performance of seasoned equity offerings include Hansen and Crutchley (1990), Healy and Palepu (1990), Patel, Emery and Lee (1993), McLaughlin, Safieddine and Vasudevan (1996), Loughran and Ritter (1997), Cai and Loughran (1998), and Kabir and Roosenboom (2003). Among the earlier studies, Hansen and Crutchley (1990) examine the long term behaviour of corporate earnings (return on assets) around three financing events: sales of common stocks, sales of convertible bonds, and sales of straight bonds. They report that, in general, earnings decline after corporate financings.

McLaughlin *et al.* (1996) examine changes in operating performance (operating cash flows scaled by the book value of assets) for a sample of 1,296 SEOs of industrial companies listed on the New York Stock Exchange, the American Stock Exchange, and NASDAQ during the period from 1980 to 1991. They find that SEO companies display significant operating performance improvements prior to the issue, but experience a significant decline following the issue, compared to the median industry performance. They interpret their findings as support for Myers and Majluf's (1984) asymmetric information theory, which argues that if managers possess superior information about a company's future prospects, they are more likely to issue equity when the company's shares are overpriced. They also find that the decline in the operating performance is greater for companies that have higher 'free cash flows'. This is consistent with Jensen's (1986) 'free cash flow' theory, which argues that due to a divergence of interests between managers and shareholders, managers prefer to retain excess cash flow in the company and may waste funds by taking up negative NPV projects. By issuing equity, the cash flow available for managers will increase, possibly inducing

managers to use the cash for value reducing investment activities that lead to poor post-issue performance.

Loughran and Ritter (1997) examine the operating performance for a window from year -4 and +4 for 1,338 SEOs in the US for the period 1979 to1989. They provide evidence that there is considerable improvement in the profitability of issuing companies before the offerings, with a peak at about the time of the offerings. However, there is a deterioration in profitability afterwards. All six operating performance measures decline significantly in the following four years relative to non-issuing companies matched by asset size, industry, and operating performance. These patterns are present for both large and small issuers, but the post-issue deterioration is more severe for smaller issuers.

Cai and Loughran (1998) investigate a comprehensive sample of 1,389 Japanese SEOs during the period 1971 to 1992. Similar to the evidence found for Japanese IPOs (Cai and Wei, 1997), they find a significant post-issue decline in operating performance following SEOs. In addition, they examine whether the 'agency' or 'timing' hypotheses can better explain the performance deterioration of Japanese SEOs. Their results support Cai and Wei's (1997) study in which the cross-sectional variation of post issue performance changes is not related to the level of agency costs prior to the issue. They also find that neither keiretsu affiliation nor ownership structure can explain the poor performance by issuing companies. Both of these studies, based on Japanese financial markets, are inconsistent with agency theory, suggesting that the results may be explained by the 'window of opportunity' or 'timing' hypothesis.

Kabir and Roosenboom (2003) examine whether the stock market valuation impact observed during the announcement of equity rights offerings in the Netherlands is correlated with subsequent operating performance. They find that a statistically significant stock price decline takes place during the announcement and subscription periods. Consistent with the announcement period decline in stock price, they also observe a statistically significant deterioration in operating performance[76] from one up to five years after the offerings. They conclude that the stock market has the ability to correctly anticipate the future operating performance of companies. Several explanations for the observed decline in operating performance are examined. They find that companies with larger offer price discounts, exhibit larger declines in performance, providing full support for the 'information asymmetry' hypothesis, which argues that managers possess superior information about their companies compared to outside investors. Their study provides only partial support for the 'free cash flow'[77] hypothesis, which argues that managers have incentives to invest cash flows to increase company size and perquisites. Further, they find no evidence to support the 'window of opportunity'[78] hypothesis, which argues that managers make a decision to issue equity depending on favourable economic conditions. However, the proxies used for both 'free cash flow' and 'window of opportunity' are relatively weak.

[76] Abnormal or excess operating performance is calculated as the difference in performance between issuing companies and median non-issuing company. The operating performance is measured by four measures of return on assets and four measures of return on sales.

[77] They use the ratio of market-to-book value of total assets as a proxy for free cash flows.

[78] The annual growth rate of gross domestic product is used to proxy for window of opportunity.

Overall, the evidence suggests that the long run operating performance of SEOs follows a similar pattern to that of IPOs, in which performance declines following the share offering.

7.3 Research questions

Studies investigating the performance of companies involved in new equity issues hypothesise that the market should impound anticipated future operating performance in the share price of the IPO companies on the first day of trading. The results reported in Chapter 6, together with the empirical evidence on the Malaysian market, reveal that the IPO companies' shareholders gain very high positive initial returns (e.g., Dawson, 1987; Ku Ismail *et al.*, 1993, Loughran *et al.,* 1994; Yong, 1997). However, assessment of the long run stock market performance tends to produce conflicting results, possibly affected by the methods used to calculate long run abnormal returns. Thus, it may be useful to investigate the performance of the IPO companies using accounting-based measures as well as market-based ones. Such investigations may offer insights into the widely debated question of whether the abnormal stock returns reported in Chapter 6 are valid or whether they are caused by measurement errors (as argued by Fama, 1998). Consistent results across the market-based and the accounting-based approaches would suggest that the results are not likely to be driven by measurement errors or misspecification.

In general, all studies have found that both accrual- and cash flow-based operating performance measures decline in the post-IPO period, but with variations between the two measures. It can be argued that both the accrual and cash flow conclusions revealed from these studies have some limitations. The accrual accounting profits measure is

more subject to accounting manipulation by managers, such as through working capital adjustments. Even though cash flow-based measures are less sensitive to accrual manipulation, companies may still be able to make operating cash flows appear to be greater than they really are by misclassifying the cash flows among the operating, investing, and financing sections of the statement of cash flows. For instance, certain cash outflows that should be offset directly against operating cash inflows may be classified as investing cash outflows (Broome, 2004, p. 19). However, not all studies have employed the cash flow approach in measuring operating performance following IPOs. Furthermore, the operating cash flow measure adopted has not always been 'properly' calculated, thereby resulting in a poor proxy (Bowen *et al.*, 1986). Using 'proper' measures of cash flows to examine IPO companies' operating performance will cast light on the extent of the impact of working capital manipulation on profitability. If the observed operating performance using the cash flow-based performance measure declines, then it can be stated that there is a deterioration in the post-IPO operating performance, which is not due to accounting manipulation. Therefore, the present study uses both accrual and 'good' cash flow-based performance measures with additional adjustment, as suggested by Bowen *et al.* (1986). Based on the review of prior literature, the following two broad research questions are identified:

1. *'Are accounting-based performance measures consistent with market-based performance measures?'*

2. *'Do the accrual- and cash flow-based performance measures improve or deteriorate following IPOs in the long run?'*

In order to test these broad research questions, several hypotheses are outlined in the following sections.

7.4 Formal hypotheses

As reviewed in the previous section, Jain and Kini (1994), Cai and Wei (1997), and Kim *et al.* (2004), among others, find significant declines in post-IPO operating performance in both accrual and cash flow performance measures, both before and after adjustment for their benchmarks. The observed decline in operating performance may not be too surprising. As pointed out by Jain and Kini (1994), managers may time their issues to follow periods of extraordinarily good performance. Investors may be overly optimistic about their companies' future performance based on the performance observed at the time of the IPO. Managers take advantage of this overvaluation by issuing equity when their equity is 'overvalued', thereby reducing their overall cost of equity. In addition, they may engage in 'window dressing' their corporate accounts at the time of going public, which leads to the pre-IPO performance being overstated and the post-IPO performance being understated. As a result of the 'over-optimism' and 'window-dressing' hypotheses, Jain and Kini (1994) argue that IPOs are followed by significant declines in operating performance.

Jain and Kini (1994), Cai and Wei (1997), Chan *et al.* (2003), and Kim *et al.* (2004) provide further explanation for the post-IPO operating performance by examining changes in other accounting measures, such sales, asset turnover, and capital expenditure. Kim *et al.* (2004) argue that the decline in post-IPO operating performance can be expected if the companies cannot generate the same positive NPV projects as they did in the pre-IPO periods or if the required level of capital expenditure

cannot be maintained by managers. Jain and Kini (1994) and Kim *et al.* (2004) find that although IPO companies show high post-issue growth in sales and capital expenditure, their measures of operating performance decline. This suggests that the reductions in operating performance are not related to a decline in business activity as indicated by lack of sales growth or post-IPO cutbacks in capital expenditure.

Loughran and Ritter (1995) point out that IPO companies typically experience pre-IPO improvements in their operating performance. They suggest that *'the market appears to overweight this recent [pre-IPO] improvement and underweight long term, mean reverting tendencies in operating performance measures...[and]...is systematically misestimating the autocorrelation of earnings growth'* (p. 49). The literature from the United States clearly shows that companies typically go public after strong operating performance. However, companies fail to uphold the growth rates attained in the year or two before flotation. This may be as a result of 'market-timing' or deliberate overstatement of pre-issue performance by managers. Consequently, the present study hypothesises a decline in the level of 'market expectation' measures in the post-IPO period due to misevaluations by investors at the time of going public.

LaPorta, Lopez-de-Silanes and Shleifer (1999) and Kim *et al.* (2004) both suggest that ownership structure plays a vital role in corporate finance for emerging market countries. It would appear that the relationship between the ownership structures of IPO companies and post-IPO operating performance has not been tested for the Malaysian market. It is interesting to investigate this relationship since many Malaysian IPO companies are family owned. Due to the fact that managers and owners are usually

the same persons, they may exert influence and control over the companies that they own.[79] As argued by Demsetz (1983), such owners may choose non-pecuniary consumption, perhaps, extracting scarce resources from profitable projects. Anderson and Reeb (2003) argue that if executive management positions are limited to family members, such companies may not have sufficiently qualified or talented management. Therefore, companies that are owned and managed by family members may experience poor performance. Alternatively, Fama and Jensen (1983) argue that the costs of monitoring[80] are less for family owned companies, an argument supported by McConaughy, Matthews and Fialko (2001), who suggest that family ownership and control are advantageous in minimising the agency problems or conflicts that may exist in companies run by professional managers. Evidence from McConaughy, Walker, Henderson, and Mishra (1998) indicate that family relationships improve monitoring and offer incentives that were associated with better company performance. Given these conflicting arguments, the net effect of family ownership on post-IPO operating performance is difficult to predict.

Leland and Pyle (1977) and Downes and Heinkel (1982) use the fraction of equity retention by insiders as a signal of company value. The argument is that insiders will hold a significant ownership interest only if they anticipate that future cash flows will be high relative to the present company value. Therefore, high retained ownership may be reflected in high post-IPO operating performance.

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[79] This is evident in the work of Claessens, Djankov and Lang (2000), whose investigate the corporate ownership for East Asian companies.

[80] Monitoring occurs when professional managers are hired (Burkart, Panunzi and Shleifer, 2003).

As mentioned in Chapter 3, underpricing may be used as a tool to signal the quality of issuers to the market (Allen and Faulhaber, 1989; Grinblatt and Hwang, 1989, and Welch, 1989). Welch (1989) presents a signalling model which assumes that 'high quality' issuers whose quality is not otherwise known by the market tend to underprice their shares at the time of IPOs. The 'high quality' issuers then conduct a seasoned equity offering[81] when the market price is established after their quality is 'discovered' by investors, to recoup opportunity losses at the time of the IPO. Therefore, according to the signalling theory of underpricing, companies that underprice should experience better post-IPO performance in comparison to companies that do not. Thus, the present study expects to observe a positive relationship between underpricing and post-IPO operating performance.

Based on the above explanations, the hypotheses of the current study are as follows:

H1: There is a difference in the level of operating performance of IPO companies as compared to their benchmarks in each year.

H2: There is a difference in the percentage (p) of IPO companies outperforming their matched companies than would be expected by chance (which is typically tested by assuming p = 50%) in each year.

[81] Wan Hussin (2001) reported that 14% of companies listed during the period 1990 to 1997 made at least one SEO within three years of the IPO year.

H3: There is a difference between the change in operating performance for IPO companies and their benchmarks, when change is measured against pre-IPO level.

H4: There is a difference between the change in operating performance for IPO companies and their benchmarks, when change is measured against the previous year's performance.

H5: There is a difference between the sources of operating performance changes for IPO companies and their benchmarks, when change is measured against pre-IPO level.

H6: There is a difference between the sources of operating performance changes for IPO companies and their benchmarks, when change is measured against the previous year's performance.

H7: There is a difference between the change in market expectations variables for IPO companies and their benchmarks, when change is measured against pre-IPO level.

H8: There is a difference between the change in market expectations variables of IPO companies and their benchmarks, when change is measured against the previous year's performance.

H9: There is a difference between the change in leverage for IPO companies and their benchmarks, when change is measured against pre-IPO level.

H10: There is a difference between the change in leverage for IPO companies and their benchmarks, when change is measured against the previous year's performance.

H11: There is a difference between the 'family relationships' group and 'non-family relationships' group pre- and post-IPO performance.

H12: There is a difference between the 'high ownership retention' group and 'low ownership retention' group pre- and post-IPO performance.

H13: There is a difference between the 'high underpricing' groups and 'low underpricing' group pre- and post-IPO performance.

7.5 Summary

This chapter provides a review on the accounting-based operating performance of IPOs, covering both private IPOs and privatisation IPOs. It presents evidence that operating performance declines after IPOs for private non-financial companies but shows an improvement for privatisation IPOs. The hypotheses on the pre- and post-IPO operating performance, source of operating performance changes, market expectations and earnings performance are outlined. The possible impact of ownership variables and underpricing on post-IPO operating performance are also described.

The next chapter describes the research design used to investigate the accounting-based operating performance of Malaysian IPOs.

Chapter 8

Research design to investigate accounting-based operating performance

8.1 Introduction

Having reviewed the relevant literature and developed testable hypotheses in Chapter 7, this chapter discusses the research design employed to examine whether there is a change in accounting performance following an IPO. The remainder of this chapter is structured as follows: the first section describes the sources of the accounting data while the second discusses the criteria used to select the IPO sample and the matching companies. The third section discusses the methods used to measure accounting-based operating performance. The pre-and post-IPO performance are analysed with reference to a variety of measures: accruals-based, cash flow-based, and other accounting measures, such as sources of operating performance changes, market expectations and leverage. The family relationships, retained ownership and underpricing are also described. The final section summarises this chapter.

8.2 Data sources on accounting performance

The examination of accounting performance adopts the same time-frame as that used in Chapter 5 to study stock market performance. The sample period is selected to give attention to recent IPOs and to have sufficient data on post-IPO accounting performance. The IPO selection period ends in December 2000 to make sure that at least three years of post-IPO data is available for the sample companies. The choice of a three-year post-IPO period is to enable the long term impact of the IPO to be observed

and is consistent with the period used to examine the long run stock market performance. Extension beyond the three years further increases the likelihood of intervening events 'contaminating' the relationship between the IPO and performance. If a period greater than three years was used, it would also be necessary either to end the IPO selection period earlier, thereby reducing the relevance of the results, or to reduce the sample size, thereby reducing the reliability of the study.

Ideally, it would have been useful to compare the level and change in the performance of each IPO company from three years prior to an IPO. However, the lack of data for two and three years before the IPOs prevented this. Most of the incomplete data are balance sheet and cash flow statement items. Datastream does not carry researchable historic profit and loss accounts, balance sheets and cash flow information for all Malaysian companies. Furthermore, an inspection of the IPO prospectuses reveals that most companies do not report their historical consolidated balance sheets. In addition, it was not compulsory for Malaysian IPO companies to report their statement of cash flows in their prospectuses. Instead, these companies typically include only the individual balance sheets for the company and for its subsidiaries. Where consolidated group accounts were provided, details of the current assets and liabilities, which are required to determine cash flow-based measures, typically were not reported.

One of the reasons why companies do not report consolidated accounts is that the financial year-ends of the companies were not the same as their subsidiaries. Typically, such companies only recently acquired subsidiaries and were involved in financial restructuring, such as bonus or rights issues, at the same time as public listing. In addition, several companies do not have comparative figures in their first public annual

reports since they were incorporated immediately prior to the IPOs. These are a common feature of Malaysian IPOs.

Given the difficulty in obtaining earlier data, it was necessary to use a one-year period prior to the IPOs as the pre-IPO measure of accounting performance. Performance in the IPO year, and each of the three post-IPOs years, are compared with pre-IPO performance; year-to-year performance changes are also measured and reported. Due to this, five years of data on each proxy variable for each company and matched company were collected for the purpose of examining the pre- and post-operating performance of Malaysian IPOs; thus, five years of data had to be available for each of the sample companies.

Data was collected from various sources. Income statement items (turnover, profit before tax, and earnings per share) prior to the IPO were hand-collected from the offering prospectuses from the '*summary of information*' section under the heading '*financial highlights*'. The data were then cross-checked with the first published annual reports of the newly-listed company, which shows comparative figures for the pre-IPO year and the IPO year (immediately before and after listing). If the prospectuses were not available, the pre-IPO income statement data were collected from the first published annual reports. Several balance sheet and cash flow statement data items prior to the IPOs were also collected from the first published annual reports: (i) total assets; (ii) current assets; (iii) cash and equivalents; (iv) current liabilities; (v) short term borrowings; (vi) long term borrowings; (vii) equity capital and reserves; (viii) cash flow generated from operations; and (ix) cash paid on purchase of fixed assets. Since the

cash flow statement was adopted in Malaysia only in 1996, following the International Accounting Standard (IAS) 7,[82] the cash flow from operations for each IPO and matching company were manually calculated, as in Table 8.1. Notes payable, and the current portion of long term debt were excluded from the definition of changes in working capital because these relate more to financing activities than to operations (Bowen *et al.*, 1986).

Table 8.1 Operating cash flow calculation

Profit before taxation
Add: Adjustments for items not involving the movement of funds (e.g., Depreciation, amortisation of intangible assets, investment written off, deferred expenditure written off, intangible assets written off, (gain)/loss on disposal of fixed assets, interest expense/(income), provision for doubtful debts, provision for diminution in investment)
= Cash flow generated from operations before working capital changes
Add: Decrease/(increase) in current assets (e.g., trade receivables, stocks, prepayments, and other receivables)
Add: (Decrease)/increase in current liabilities (e.g., trade creditors, interest accrued, and other creditors)
= Cash flow generated from operations

Post-IPO data items were collected from different sources, including Datastream. Initially, the financial data were downloaded from Datastream for every company for a four-year period, which is from the IPO year to three years after. Financial data are not available from Datastream for non-listed companies so data were only available starting from the IPO year (defined as year 0). However, initial data collection revealed that

[82] The IAS 7 was replaced by Malaysian Accounting Standard Board (MASB) 5 in 1999.

most of the accounting data were not available from Datastream, especially for fiscal years prior to 1993.

The second source of data was the Pacific-Basin Capital Markets (PACAP) database, which provides capital markets data for countries in the Pacific Basin region. However, the financial information available on this database stops at 31 December 1996. Where there is no data available, or where data is missing from the Datastream and PACAP databases, the annual report of the company was obtained from one of two sources. The first of these is the KLSE website at www.klse.com.my, which, as at 14 March 2004, had annual reports for the 31 December 1999 fiscal year end onwards. The remaining financial data for IPO companies and matched companies were extracted from the annual reports obtained from the Public Information Centre,[83] Bursa Malaysia, necessitating a visit to Malaysia from 24 April to 16 June 2004. The following section provides an explanation of the process of selecting the sample of IPO companies and their benchmarks.

8.3 Sample selection

8.3.1 Selecting IPO companies

This section describes a slightly similar procedure for selecting the IPO companies and their benchmarks to that described in Section 5.3.2 of Chapter 5. There were 543 new

[83] As of 1 May 2004, the Kuala Lumpur Stock Exchange (KLSE) was renamed Bursa Malaysia with a new domain name of www.bursamalaysia.com. The Public Information Centre (PIC), which was set up in 1986 as the corporate library of Bursa Malaysia, and a centre of knowledge to the industry. It comprises books, reports, CDs and videos on Technical and Fund Analysis, Investment basics, Equity Derivatives, etc.

companies listed on the KLSE during the period 1990 to 2000. The Datastream Code (DSCODE) for IPO companies and their benchmarks must have been present on Datastream in order to collect the data on accounting performance. Similar to the selection criteria and reasoning discussed in Chapter 5, companies that are listed under Infrastructure Project Companies, Finance, Trust and Closed-End Funds sectors are excluded. However, the Properties sector was included in the sample because it is not classified as a financial sector by the KLSE. Sector exclusions reduced the population to 504 companies. Another six companies were excluded because they are not strictly IPO companies as they were listed via 'introduction'; they also made a combination offering of debt together with equity, so were excluded to avoid any confounding effects of the debt issue. This left 498 IPO companies available for analysis.

Table 8.2 shows the detail screening process in obtaining the final sample, including the availability of the first[84] and subsequent published public annual reports,[85] the companies' files, and no change in fiscal year end.[86]

[84] Companies that have no comparative figures in the first public annual reports were excluded because comparison of pre- and post performance cannot be made and a time-series of variables is required for the cash flow analysis.

[85] Companies that have missing annual reports for certain years (even when the company file is in existence) or the annual reports have not yet been prepared (for companies having a Dec 2004 fiscal year end at the time when the analysis was undertaken) were excluded.

[86] The change of fiscal year end results in no accounting data being available for a particular year. In addition, the data were reported inconsistently due to the fact that the financial statements were presented for periods with varying time-spans, which limits the comparability of the accounting measures. However, if this occurred to the matched company, the matched company was replaced and the process of finding a matching company was repeated.

Table 8.2 Process of data screening and distribution of 254 IPOs listed during the period 1990 to 2000 by year

Steps of data collection by year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
Initial data on new listings	31	39	45	44	66	51	92	88	28	21	38	543
Infrastructure Project Companies, Finance, Trust and Closed-End Funds sectors	4	8	6	1	2	2	9	7	0	0	0	39
New listings via *'introduction'* or companies making combination offerings	1	1	1	0	0	0	0	1	0	2	0	6
Potential numbers of IPOs available	26	30	38	43	64	49	83	80	28	19	38	498
No comparative figures on the first public annual reports	5	6	5	14	19	17	27	31	8	8	11	151
Missing annual report file	5	7	6	6	14	8	10	5	4	0	0	65
Incomplete full five years of financial data	0	0	7	1	0	2	0	0	0	0	11	21
Company with a change of fiscal year end	0	0	1	2	2	0	0	1	1	0	0	7
Final sample (percentage sample selected) for operating performance analysis	**16 (62%)**	**17 (57%)**	**19 (50%)**	**20 (47%)**	**29 (45%)**	**22 (45%)**	**46 (55%)**	**43 (54%)**	**15 (54%)**	**11 (58%)**	**16 (42%)**	**254 (51%)**

The final sample comprised 508 companies, 254 IPOs and their 254 matching companies. More than half of the data were hand-collected. Furthermore, the cash flow data for the fiscal period prior to 1996 have to be calculated individually for each company and their matched companies. Although just half of the potential numbers of Malaysian IPO companies remain, the large sample size suggests that it is likely to be representative. The only previous study investigating the operating performance of Malaysian IPOs used a sample of just 24 privatisation IPOs (Sun and Tong, 2002). The current study comprises 239 private IPOs and 15 privatisation IPOs.

8.3.2 Selecting matching companies

A proper benchmark is required to compare the performance of IPO companies to ensure that the performance change is not a manifestation of the IPO companies' characteristics or industry-specific factors. There are two possible benchmarks that could be adopted to compare the performance of each sample company: (i) the industry median; or (ii) a single non-IPO matching company in the same industry with similar pre-IPO performance and size.

As summarised in Table 7.1 in the previous chapter, Jain and Kini (1994), Cai and Wei (1997), Teoh *et al.* (1998a), Kutsuna *et al.* (2002), Khurshed *et al.* (2003), and Kim *et al.* (2004) have adopted the industry median benchmark to control for variation in normal operating performance measures across different lines of business (Mikkelson *et al.*, 1997) and to minimise the change in operating performance (Jain and Kini, 1994). The lack of a suitable number of available companies in a particular industry to compute the industry median may introduce bias in the benchmark's calculation.

Cai and Wei (1997) and Mikkelson *et al.* (1997) use individual matching companies as a benchmark, selecting matching companies based on pre-event performance as a control for the change in performance that is expected or normal, and unrelated to going public. Barber and Lyon (1996) argue that matching on pre-IPO performance could control for potential mean reversion in earnings and other operating ratios over time. They conclude that tests using matching companies that are not matched on pre-operating performance are misspecified if the event companies have either especially good or especially poor prior operating performance. In other words, matching the IPO companies with pre-event performance enabled control for the IPO company's performance history, in which companies are likely to issue equity when their performance is usually high. There may also be a temporary component to the companies' operating income due to manipulation of accounting numbers, accounting changes, or nonrecurring expense or income. This may lead to a conclusion of performance change, when in fact the accounting measure is merely reverting to its mean. Mikkelson *et al.* (1997) also select their matching companies based on total assets to account for the effect of company size, though other variables can be used, such as turnover or market value.

This study does not employ the median industry performance benchmark since the industry cash flow operating performance measures were not available and the small number of companies in certain Malaysian industries may introduce bias in the industry median computation. Instead, a matching company matched by industry (to control for industry), pre-operating performance (to control for a continuation of company specific performance before the IPOs), and total assets (to control for size effects) is used in the present study. Barber and Lyon (1996) state that the use of a matching company as a benchmark yields test statistics that are well specified. As argued by Perry and William

(1994), companies in the same industry, with similar pre-IPO performance and similar size, are assumed to have similar economic and competitive factors, and thus to have comparable operating, investing, and financing opportunity sets.

For this part of the study, it was necessary to select a new set of sample companies from those listed on the Main Board and the Second Board of the KLSE during the period 1990 to 2000. Companies in the control sample were individually matched to companies in the IPO sample based on the above three criteria. The matching process started with a group of potential matching companies that had not been involved in an IPO in the previous three years, in line with prior studies examining accounting performance (e.g., Jain and Kini, 1994; Loughran and Ritter, 1997). Companies were matched first by industry, then by comparable pre-IPO performance and total assets. The Datastream Level 3 industry sub-sector was used to classify the industry for all companies except the Property sector, for which the Level 6 industry sub-sector was employed. The pre-IPO performance matching was based on operating profit before tax divided by total sales. From this initial screen, the matched company was required to have pre-IPO operating performance within the range of 90% to 110% of sample IPO companies; and beginning total assets within 70% to 130% of sample IPO company total assets in year –1.[87] If a matched company could not be found based on all three measures, the size criterion was relaxed and matching was based on industry and pre-IPO performance. Failure to match led to relaxation of the pre-IPO performance criteria, and matching was just based on industry. However, there are certain industry groups, such as 'Information Technology', which do not have enough potential

[87] The same pre-operating performance and size filters were used by Barber and Lyon (1996).

matching companies. In this case, IPO companies were matched based on pre-IPO performance and total assets, regardless of industry. Finally, a small number of companies were matched on pre-IPO performance regardless of industry and total assets.

Of the 254 usable companies for the accounting performance analysis, 36 were matched on the basis of industry, pre-IPO performance, and total assets, 138 were matched on the basis of industry and pre-IPO performance, while 69 were matched on the basis of industry only. Of the remaining 11 companies, four were matched on the basis of pre-IPO performance and total assets, and seven were matched only on the basis of pre-IPO performance regardless of industry. The difficulty of applying the comprehensive three measure matching process arose from the small number of Malaysian listed companies in various industries.

8.4 Methods

According to Barber and Lyon (1996), three steps must be undertaken in designing a study that uses accounting-based operating performance. The first step is to select a measure of accounting performance. The second step is to develop a model of expected performance, a benchmark against which to judge actual performance. The third step is to select an appropriate statistical test. These are discussed in turn.

8.4.1 Measure of accounting-based operating performance

There does not appear to be a preferred indicator of operating performance, and prior studies use different measures to estimate abnormal operating performance. Financial

ratios are usually used, allowing the operating performance of IPOs to be compared over a point in time and across companies. This study examines various measures of operating performance and employs two different approaches to check the robustness of the results on long run operating performance. The first approach is based on accrual accounting profit and the second on cash flow.

8.4.1.1 Accrual-based measure

Operating performance has traditionally been measured in terms of profit. The present study employs five accrual-based operating profit variables. The first two relate operating profit to assets, and calculate the average profit that a company generates for each dollar of assets. They measure the efficiency of the manager in running the business. They also provide a measure of the productivity of assets used to generate operating profit from a company's operations ,that incorporates profitability and efficiency. The operating profit variables are all measured before taxes (except for the measure of per share basis) to avoid the effect of tax rate changes imposed by the Malaysian government during the period of the analysis.[88]

The choice of denominator is contentious. Barber and Lyon (1996) suggest that total assets reflect both operating and non-operating assets, so they may understate the true productivity of operating assets. However, they also recognise that IPO companies could experience large increases in cash balances at the time of IPOs but may not immediately invest those funds. Therefore, focusing on operating assets (deducting

[88] The corporate tax rate was 35%, 34%, 32%, 30%, and 28% in the years 1990-1992, 1993, 1994, 1995-1997, and 1998-2003 respectively (The Inland Revenue Board of Malaysia, 2005).

cash balances from total assets) will influence the results, especially when the cash balance in sample IPO companies and matched companies are significantly different. In the present study, both total assets and operating assets are used as denominators to check the robustness of results. The definitions are:

Operating return on total assets (OI/TA)

$$= \frac{Operating\ profit\ before\ tax}{Total\ assets} \qquad (8.1)$$

Operating return on operating assets (OI/OA)

$$= \frac{Operating\ profit\ before\ tax}{Total\ assets - (Cash\ and\ equivalents)} \qquad (8.2)$$

If a company does not disclose total assets in the balance sheet, total assets are calculated by taking the sum of tangible and intangible fixed assets, other long term assets and investments, and current assets. The present study does not use the market value of assets because the data are not available prior to going public.

Barber and Lyon (1996) also caution against the use of assets as the denominator when companies have recently issued securities. Such companies can have a large increase in book value of assets, but no immediate increase in operating profit. As noted by Mikkelson *et al.* (1997), accounting profitability scaled by assets might be downwardly biased after IPOs. To reduce such bias, the present study also deflates the operating profit by total sales since these are unaffected by the change in the assets base (Barber and Lyon, 1996). The operating return on sales calculates the profit that a company generates for every dollar of sales. The definition is:

Operating return on sales (OI/Sales)

$$= \frac{Operating\ profit\ before\ tax}{Total\ sales} \qquad (8.3)$$

The operating return on equity is also employed since it is more relevant to shareholders. To ensure consistency of the numerator, the operating profit used is also before tax. The definition is:

$$= \frac{Operating\ profit\ before\ tax}{Equity\ capital\ and\ reserves} \qquad (8.4)$$

The final accrual-based operating performance measure is earnings per share, which is defined as:

$$= \frac{Published\ earnings\ for\ ordinary}{Average\ number\ of\ shares\ in\ issue\ during\ the\ period} \qquad (8.5)$$

The average number of shares in issue during the period is adjusted for subsequent rights and scrip issues.

There is a problem associated with an accrual-based profit measure, in that it is open to manipulation by managers. Evidence from previous research (e.g., Teoh *et al.*, 1998a) indicates that IPO companies may use accruals to overstate their reported earnings. In addition, the accounting accruals process tends to smooth reported earnings relative to cash flows (Holthausen and Larcker, 1996). Thus, an alternative performance measure based on cash flows may be preferable.

8.4.1.2 Cash flow-based measure

Kaplan (1989), Jain and Kini (1994) and Kim *et al.* (2004), among others, argue that operating cash flows are a useful measure of operating performance because they are a primary component in the calculation of net present value (NPV) in determining the company value. The cash flow-based performance measure should be less sensitive to manipulation by managers and show more variability than the accrual-based measure. A further advantage of the cash-flow based performance measure is that it is not directly affected by non-cash items, such as depreciation, goodwill, or changes in working capital management.

Several previous studies compute operating cash flow by deducting capital expenditure from operating income (e.g., Jain and Kini, 1994; Cai and Wei, 1997; Chan *et al.*, 2003) or adding back depreciation to earnings before interest and taxes (e.g., Kim *et al.*, 2004). The cash flow proxies employed by these studies do not equate to operating cash flow and have been criticised as poor proxies (Bowen *et al.*, 1986). Consequently, the present study uses an improved cash flow measure which eliminates the accounting accruals that can be manipulated by managers. This calculation (shown previously in Table 8.1) is similar to that employed by Roosenboom *et al.* (2003). As with the accrual profit measure, three cash flow variables are used on a before tax basis. The reasons for using such denominators are also similar. The definitions are:

Operating cash flows return on operating assets (OCF/TA)

$$= \frac{Cash\ flow\ generated\ from\ operations}{Total\ assets} \qquad (8.6)$$

Operating cash flows return on operating assets (OCF/OA)

$$= \frac{Cash\ flow\ generated\ from\ operations}{Total\ assets - (Cash\ and\ equivalents)} \qquad (8.7)$$

Operating cash flow return on sales (OCF/Sales)

$$= \frac{Cash\ flow\ generated\ from\ operations}{Total\ sales} \qquad (8.8)$$

8.4.2 Other measures of accounting performance

While the main focus of this study is on accrual-based and cash flow-based measures of operating performance, it also investigates the potential sources that might offer an explanation for changes in the operating performance.

8.4.2.1 Sources of operating performance changes

In line with prior research (e.g., Jain and Kini, 1994; Cai and Wei, 1997; Chan *et al.*, 2003; Kim *et al.*, 2004), three measures were used: (i) sales; (ii) capital expenditure; and (iii) asset turnover. Sales are usually employed to measure output, and asset turnover is used to measure efficiency. Asset turnover is the ratio of sales to total assets. It measures how efficiently a company uses its assets to generate sales. The definition is:

Asset turnover

$$= \frac{Total\ sales}{Total\ assets} \qquad (8.9)$$

The percentage change in sales, capital expenditure and asset turnover in each year from the pre-IPO year, or the previous year, was calculated as the first difference in the data series deflated by the previous year's value for the data series:

Source of operating performance change (t)

$$= \textit{the value of} \left[\frac{\textit{Source measure}_i(t) - \textit{Source measure}_i(-1 \textit{ or } t-1)}{\textit{Source measure}_i(-1 \textit{ or } t-1)} \right] \qquad (8.10)$$

where:

i = *IPO company or benchmark;*

-1 = *the fiscal year prior to the IPO, which is year -1;*

t = *a post-IPO fiscal year end, which is year 0, year +1, year +2 and year +3;*

Since five years of data are available for sample companies, each time-series has four observations for each company, after differencing. The median or mean source of operating performance changes is expressed relative to year -1, or the previous year, by considering only companies with positive values of capital expenditure and asset turnover.

8.4.2.2 Market expectations

The market expectations variables are also considered to assess whether investors have high expectations at the time of IPOs for their companies' future performance. Changes in market expectations are measured relative to the IPO year (year 0) since share price data are not available prior to the IPOs. Following Jain and Kini (1994), two market

expectations proxies are used: (i) the market-to-book ratio of assets; and (ii) the market-to-book ratio of equity. The definitions are:

Market-to-book ratio of assets (MTBA)

$$= \frac{Market\ value\ of\ equity + Market\ value\ of\ debt}{Book\ value\ of\ equity\ and\ reserves + Book\ value\ of\ debt} \qquad (8.11)$$

Market-to-book ratio of equity (MTBE)

$$= \frac{Market\ value\ of\ equity}{Book\ value\ of\ equity\ capital\ and\ reserve} \qquad (8.12)$$

The market value of equity is the number of shares outstanding times the share price. This study assumes that the market value of debt is equivalent to the book value of debt, as used by Jain and Kini (1994). Debt consists of total long term and short term borrowings.

8.4.2.3 Leverage

The leverage ratios are utilised to look at the financing decision of the IPO companies' pre- and post-IPOs. Two measures of leverage are employed to provide a robustness test on this measure: (i) total debt over total assets; and (ii) total debt over equity. The definitions are:

Total debt over total assets (TD/TA)

$$= \frac{Total\ of\ long\ and\ short\ term\ borrowings}{Total\ assets} \qquad (8.13)$$

Total debt over equity (TD/Equity)

$$= \frac{Total\ of\ long\ and\ short\ term\ borrowings}{Book\ value\ of\ equity\ capital\ and\ reserves} \qquad (8.14)$$

Table 8.3 provides a summary definition of all of the accounting performance proxies.

Table 8.3 Definitions of the accounting performance measures

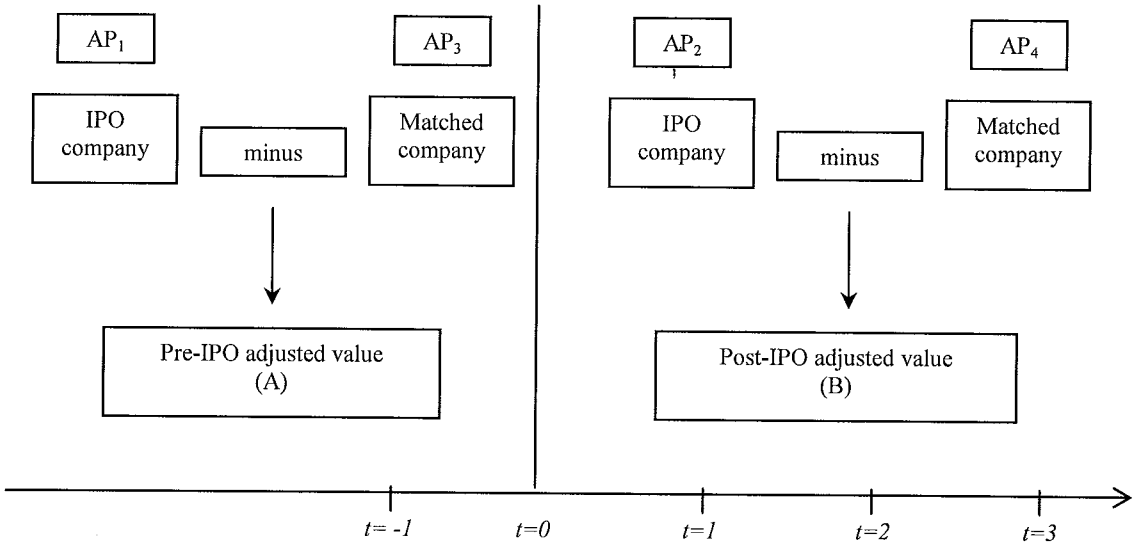
Panel A: Proxies for accounting-based operating performance measures		
(i) Accrual-based measures		
OITA	Operating return on total assets.	Operating profit before tax divided by total assets.
OI/OA	Operating return on operating assets.	Operating profit before tax divided by total assets minus cash and equivalents.
OI/Sales	Operating return on sales.	Operating profit before tax divided by total sales.
ROE	Operating return on equity.	Operating profit before tax divided by book value of equity capital and reserves.
EPS	Earnings per share.	Published earnings for ordinary divided by average number of shares in issue during the period.
(ii) Cash flow-based measures		
OCF/TA	Operating cash flow return on assets.	Cash flows generated from operation divided by total assets.
OCF/OA	Operating cash flow return on operating assets.	Cash flows generated from operation divided by total assets minus cash and equivalents.
OCF/Sales	Operating cash flow return on sales.	Cash flows generated from operation divided by total sales.
Panel B: Proxies for sources of operating performance changes		
SG	Sales.	Total sales.
CEG	Capital expenditure.	Cash paid on purchase of fixed assets.
ATG	Asset turnover.	Total sales divided by total assets.
Panel C: Proxies for market expectations		
MTB assets	Market-to-book ratio of assets.	Market value of equity plus market value of debt divided by book value of equity capital and reserves plus book value of debt.
MTB equity	Market-to-book ratio of equity.	Market value of equity divided by book value of equity capital and reserves.
Panel D: Proxies for leverage		
TD/TA	Total debt to total assets.	Total debt divided by total assets.
TD/Equity	Total debt to total equity.	Total debt divided by total equity.

The model of expected performance, which is the second step in designing the study using accounting performance, is discussed next.

8.4.3 Model of expected performance

This study has adopted a matched-company adjusted performance model. Two test variables are used to examine the pre- and post-accounting performance of IPOs. The first is the unadjusted, or raw value of IPO companies (AP_1 and AP_2). The second test variable is the matched-company adjusted variable or adjusted value, which is the IPO company's raw accounting performance minus its matched company's accounting performance (AP_1-AP_3 and AP_2-AP_4).

Figure 8.1 Design for computation of pre- and post-IPO adjusted variables



As illustrated in Figure 8.1, in order to derive the pre-IPO adjusted value (A) or abnormal accounting performance in year -1, the matching company value (AP_3) at year -1 is subtracted from the IPO value (AP_1) at year -1. In the post-IPO period t (t = 0, 1, 2, and 3), the matched company value (AP_4) in that year t is subtracted from the post-

IPO value (AP_2) during the same period *t* to derive the post-IPO adjusted value (B) in period *t*. In order to compare pre-and post-IPO performances, the post-IPO adjusted value is compared to the pre-IPO adjusted value to ascertain whether the IPO resulted in an improved or a declined accounting performance.

8.4.4 Analysis undertaken and test statistics used

Two types of analyses have been undertaken. The first is to test the level of accounting performance over time from year -1 to year +3. The second is to test the change in the accounting performance from the year immediately prior the IPO (year -1 to 0, year -1 to +1, year -1 to +2, year -1 to +3). To identify when changes (if any) took place, this study also tests the year-to-year change from the previous year (year -1 to 0, year 0 to +1, year +1 to +2, year +2 to +3). Year -1 is the fiscal year prior to the IPO year, year 0 is the fiscal year of the IPO, year +1 is fiscal year after the IPO and so forth.

While year 0 is defined as the fiscal year in which the IPO occurs, the timing of the IPO within the year will vary. Thus, for some IPO companies, year 0 financial results will relate mainly to when it is private, while for others the results will be based largely on a period when the company is public. The same convention has been used in prior studies (e.g., Teoh *et al.*, 1998a). Thus, the performance a year after the IPO is referred to as the performance over a 'fiscal' year since the company went public.

Figure 8.2 illustrates the timing conventions employed in this study in situations where the fiscal year of the IPO companies is similar to the calendar year. For each IPO company, the fiscal year before the IPO year is labelled as event year –1. The rest of the years are similarly indexed relative to the IPO year (year 0). However, not all IPO

companies have a fiscal year end coincident with the calendar year-end. Several companies prepare their financial results for the period ending April, June or September, rather than December. To avoid confusion on the timing convention, Figure 8.3 illustrates the time line in a situation where the fiscal year of the IPO companies is different from the calendar year.

Figure 8.2 Time line (Fiscal year = Calendar year)

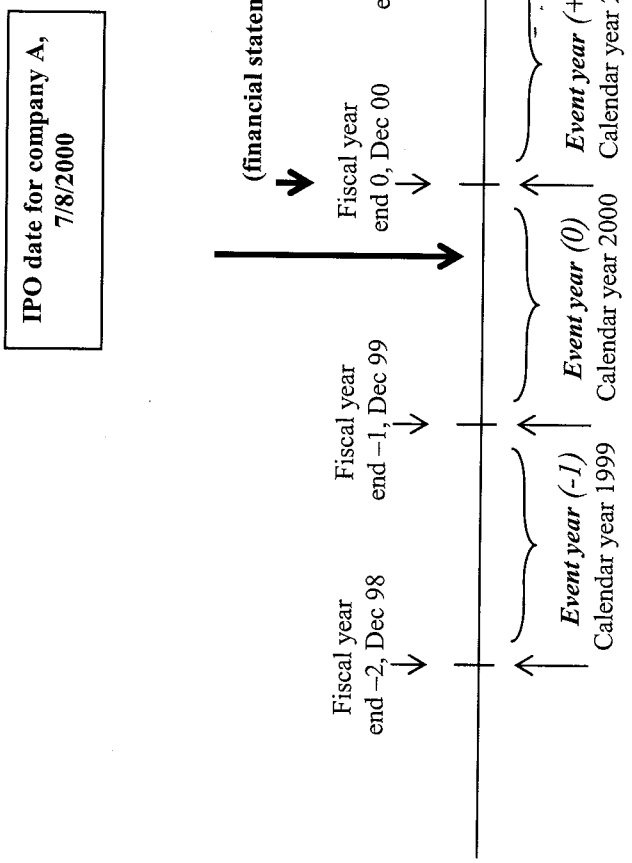
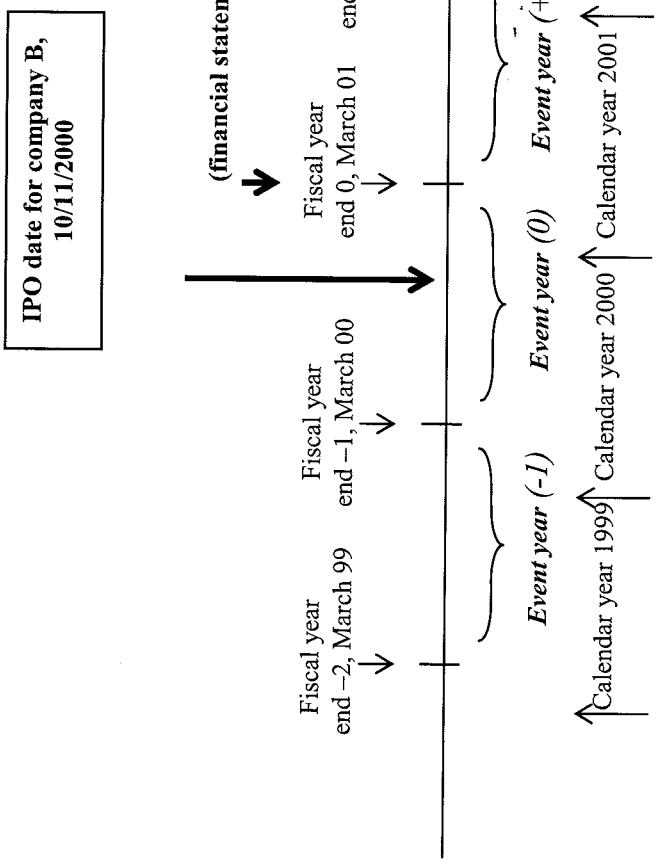


Figure 8.3 Time line (Fiscal year ≠ Calendar year)



8.4.4.1 Analysis of the level of accounting performance

In order to assess the pre and post-IPO accounting performance, all ratios are computed annually at five different points in time, i.e. at the end of the fiscal year prior to the IPO (t = -1), the IPO year (t = 0) and three fiscal years subsequent to the IPOs (t = 1, 2, and 3), respectively. The analysis focuses on the median level of the accounting performance measures instead of the mean level. This study uses the median as a measure of central tendency throughout the thesis because accounting performance measures may be skewed and the mean is particularly sensitive to outliers (Kaplan, 1989; Jain and Kini, 1994; Loughran and Ritter, 1997). The Wilcoxon matched pairs signed-ranks test is used to test whether the medians are significantly different from zero, and the paired sample t-tests for mean value.

The binomial proportionality test statistic is also employed to test whether the percentage (p) of IPO companies *over*performing their matched companies is different from what would be expected by chance (i.e. 50%). The test statistic z (assumed to be normally distributed) is calculated as:

$$z = (p_0 - 0.5) * (n \div 0.25)^{1/2} \qquad (8.15)$$

where:

p_0 = *percentage of overperformance;*

n = *number of paired IPO-matched companies comparisons*

The critical z values are 2.575, 1.960, and 1.645 at the 1, 5, and 10% level, using a two-tailed test.

8.4.4.2 Analysis of the change of accounting performance

The accounting performance measure for the last fiscal year before the IPO year (year -1) is compared to the accounting performance measure at the time of the IPO (year 0), and for the first three full fiscal years after the IPOs (year +1, year +2, year +3), as used in prior studies (e.g., Jain and Kini, 1994; Mikkelson *et al.*, 1997 and Kim *et al.*, 2004). However, these comparisons focus on the cumulative effect of performance change. Yet investors are also interested in changes in operating performance when assessing the value of companies (Jain and Kini, 1994). Therefore, this study also examines the year-to-year post-IPO changes and a one sample Wilcoxon signed-ranks test is used to test whether the median changes in performance are significantly different from zero. Following the method used by Jain and Kini (1994), the change in operating performance is measured as the median (mean) change in levels or absolute change.[89]

$Change_t$

$$= \textit{the median (or mean) value of } \{\textit{operating return}_i\ (t) - \textit{operating return}_i\ (-1) \textit{ or } (t-1)\} \qquad (8.16)$$

where:

i = *IPO company or benchmark;*

-1 = *the fiscal year prior to the IPO, which is year -1;*

[89] A similar method to measure change has been used by Kaplan (1989), Smith (1990), Muscarella and Vetsuypens (1990), Degeorge and Zeckhauser (1993) on leverage buyouts (LBOs), by Jain and Kini (1994) on IPOs and by Powell and Stark (2005) on takeovers.

t = *a post-IPO fiscal year end, which is year 0, year +1, year +2 and year +3;*

t-1 = *the fiscal year prior a post-IPO fiscal year end, which is year -1, year 0, year +1, and year +2.*

The present study uses the change model rather than the percentage change model. One of the reasons for not using the percentage change model is the negative denominator problem, whereby companies with poor performance (negative value) need to be removed from the calculation of percentage change.[90] Barber and Lyon (1996) comment that if the negative value is included in the sample, '*the result is nonsensical*' (p. 394). As argued by them, having to remove poor performing companies will reduce the power of statistical tests and lead to biases in test statistics.

The matched company-adjusted change for the IPO is the difference between the change in accounting performance for the IPO and its matched company. Again, the median (mean) change in matched company-adjusted performance is measured for year +1, +2 and +3 relative to year -1 or each previous year.

8.4.4.3 Analysis of the association between ownership structure, underpricing and post-IPO operating performance

The association between post-IPO operating performance and company ownership (family relationship and retained ownership) and IPO underpricing has also been investigated.

[90] Using the percentage change's calculation, the first difference of the data series is deflated by the previous data series value.

Family relationships

For the family relationships, '1' is used to denote a company that has a family relationship, and '0' is used to denote company that has no family relationship.[91]

Retained ownership

With regard to retained ownership, the sample is split into two groups based on median alpha.[92] Following Downes and Heinkel (1982), the retained ownership α value is calculated as:

$$\alpha = \frac{(N - N_p - N_s)}{N} \qquad (8.17)$$

where:

α = *the proportionate ownership retained by the insiders (original owners);*

N = *the total number of shares outstanding after the initial offer;*

N_p = *the number of primary shares in the initial offer (public issue);*

N_s = *the number of secondary shares offered by the insiders for resale (offer for sale).*

[91] Data on family relationships was obtained from the offering prospectuses. The family relationships information available from the prospectuses stated whether any of the directors and senior management have family relationships with other directors and senior managers, such as brother, son, spouse etc.

[92] Data to calculate the retained ownership was also obtained from the offering prospectus. The above median alpha subsample will be referred as to the 'high retained ownership' group and the below median alpha subsample as the 'low retained ownership' group.

Underpricing

The sample is also split into two groups based on median underpricing.[93] The above median underpricing sub-sample will be referred as to the 'high underpricing' group and the below median underpricing sub-sample as the 'low underpricing' group. The same analysis was undertaken by Jain and Kini (1994), and Khurshed *et al.* (2003). The significance test for comparisons between the groups is based on the one sample Mann-Whitney U test, which tests whether the difference between group medians is significantly different from zero.

8.5 Summary

This chapter provides the research design employed to investigate the accounting performance of Malaysian IPOs. The research design based on the level of accounting performance and changes in accounting performance is discussed. In addition, the accrual-based and cash-flow based measures are used to investigate accounting-based operating performance. The sources of improvement or deterioration in performance were also examined. Since prior studies noted that investors have high expectations of the future earnings growth of companies, this study examines market expectations. Two leverage ratios are used to measure the financing behaviour of those companies around the offerings. The procedure for the analysis of the relationship between company ownership, underpricing and post-IPO operating performance has also been discussed.

[93] The underpricing is raw underpricing and was calculated in a fashion similar to the formula described in Chapter 5.

The following chapter presents the results of the analyses of accounting-based operating performance.

Chapter 9

Results on post-IPO accounting-based operating performance

9.1 Introduction

This chapter provides the results of the empirical analysis of the accounting-based operating performance of Malaysian IPOs and is divided into four parts. The first presents descriptive statistics of IPO and matched companies' performance. The second part provides an analysis of changes in accounting-based operating performance, including both accrual- and cash flow-based approaches (first section), the sources of operating performance (second section), market expectations (third section), and leverage (fourth section). The third part of the chapter concentrates on univariate analysis of post-IPO operating performance for subsamples based on family relationships (first section), retained ownership (second section) and underpricing (third section). Finally, an overall summary of accounting-based operating performance is provided.

Part 1 Descriptive statistics

9.2 Descriptive statistics of IPO and matched companies performance

Table 9.1 presents the descriptive statistics for 254 IPOs and 254 matched companies. The information is pre-IPO, with market value measured on the flotation date; market value data was unobtainable for 4 IPO companies. The descriptive statistics indicate that the median (mean) operating return on sales (OI/Sales) for the sample of IPO and matched companies is 13.9% (16.3%) and 13.6% (15.3%), respectively. These are

expected to be similar since the IPO companies have been matched primarily on OI/Sales. While the difference between medians is not statistically significant, the difference between means OI/Sales is statistically significant at the 5% level. There is a wide variation in this operating margin; IPO companies range between -24% and 63% and the matched companies between -26% and 52%. The skewness (and kurtosis) is typical for company size measures generally, but also suggest a larger positive tail with greater central clustering for IPO companies.

The absolute figures of operating profit before tax, total sales, total assets, equity capital and reserves, market value, and total debt show some differences between IPO and matched companies. There are significant differences in both median and mean values at the 1% level. For example, the median (mean) total sales for IPO companies are RM65 million (RM125 million) compared with RM137 million (RM784 million) for matched companies. The difference is partly a function of the process used in size matching, since IPOs were usually matched with the closest *larger* non-IPO company, even though the size range between 70% and 130% of IPO was used. Similar observations occur for the other size measures. The highest market value of RM26,250 million for IPO companies is observed for the company Tenaga Nasional Berhad. Meanwhile, the lowest market value of RM24 million is observed for the company Carpet International Malaysia Berhad.

While the total debt of IPO companies is also smaller than for their matched companies, the gearing levels are significantly higher at the 1% (10%) level for medians (means). The median (mean) debt/equity ratio is 40% (64%) for IPOs compared with 24% (49%) for matched companies. This is not surprising given the desire to raise new equity finance expressed in the IPOs.

Table 9.1 Descriptive statistics for 254 IPO companies and 254 matched companies

	OI/Sales (%)		Operating profit before tax (RM million)		Total sales (RM million)		Total assets (RM million)		Equity capital and reserves (RM million)		MV at flotation (RM million)		Total debt (RM million)		Total debt/equity (%)	
	IPO	*Matched*	*IPO*	*Matched*	*IPO*	*Matched*	*IPO*	*Matched*	*IPO*	*Matched*	*IPO*	*Matched*	*IPO*	*Matched*	*IPO*	*Matched*
Mean	16.32[b]	15.33	18[a]	113	125[a]	784	219[a]	1,342	91[a]	616	426[a]	1,538	71[a]	377	64[c]	49
Median	13.93	13.56	9[a]	20	65[a]	137	70[a]	275	31[a]	155	142[a]	389	11[a]	40	40[a]	24
Std Deviation	10.20	10.05	56	274	295	1,733	1,086	3,676	431	1,486	2,051	3,699	455	1,658	139	77
Kurtosis	3.26	3.32	103	25	95	15	141	30	153	41	116	23	116	52	133	12
Skewness	1.09	0.47	10	5	9	4	11	5	12	6	10	4	10	7	10	2
Minimum	-24.32	-26.32	-21	-19	9	7	2	30	-11	-27	24	18	0	0	-11	-334
Maximum	62.90	52.08	702	2,376	3,702	10,780	14,855	26,526	6,071	14,459	26,250	28,134	5,670	15,023	1,938	538
Number of companies	254	254	254	254	254	254	254	254	254	254	250*	254	254	254	254	254

Note:

[a and b] IPO and matched company values significantly different at the 0.01 and 0.05 levels, respectively, using a two-tailed test.

* The number of IPO sample for market value at flotation is less than 254 due to some missing data.

Table 9.2 shows the crosstabulation between industry groups for IPO and matched companies. Industry matching seems to be very successful. Four industry groups (NCYCG, NCYSR, RESOR and RLDEV) are found to be perfectly matched (100%), and another four industry groups (BASIC, CYCGD, CYSER AND GENIN) are well matched (> 75% in the same industry). Two industries (ITECH and UTILS) are less well matched due to the relatively small number of potential matching companies in these industries.

Overall the statistics suggest that a good match between IPOs and matched companies is achieved for the primary variable (operating profit margin) and for the industry group. However, size matching is less good, demonstrating the difficulty of finding close matches from a relatively small population. In view of this, performance ratios (rather than absolute values) are employed in cross-sectional and time-series analyses in order to minimise potential bias.

Table 9.2 Industry crosstabulation

INDUSTRY		Matched companies										Number of companies	% in same industry
		BASIC	CYCGD	CYSER	GENIN	ITECH	NCYCG	NCYSR	RESOR	RLDEV	UTILS		
IPO companies	BASIC	96	1	0	0	0	1	0	0	0	0	98	97.96
	CYCGD	1	35	0	0	0	0	0	0	0	0	36	97.22
	CYSER	0	0	30	1	0	0	0	0	0	0	31	96.77
	GENIN	0	0	1	30	0	0	0	0	0	0	31	96.77
	ITECH	3	0	1	1	3	0	0	0	0	0	8	37.50
	NCYCG	0	0	0	0	0	22	0	0	0	0	22	100.00
	NCYSR	0	0	0	0	0	0	5	0	0	0	5	100.00
	RESOR	0	0	0	0	0	0	0	3	0	0	3	100.00
	RLDEV	0	0	0	0	0	0	0	0	17	0	17	100.00
	UTILS	0	1	0	0	0	0	0	0	0	2	3	66.67
Number of companies		100	37	32	32	3	23	5	3	17	2	254	**95.67**

Note:

BASIC - Basic industries.
CYCGD - Cyclical consumer goods.
CYSER - Cyclical services.
GENIN - General industrials.
ITECH - Information technology.
NCYCG - Non-cyclical consumer goods.
NCYSR - Non-cyclical services.
RESOR - Resources.
RLDEV - Real estate development.
UTILS - Utilities.

Part 2 Changes in accounting-based operating performance

9.3 Accrual-based operating performance

Prior to investigating the *changes* in the operating performance of the Malaysian IPOs, it is useful to consider the *level* of operating performance of IPO companies and their respective matched companies over time for the pre-IPO period, during the IPO, and the post-IPO period. The analysis of the level of performance is conducted to identify any differences between IPO and matched companies throughout years -1, 0, +1, +2, and +3. Similar to Jain and Kini (1994), Mikkelson *et al.* (1997), and Kim *et al.* (2004), the analysis focuses on median performance due to the tendencies of accounting ratio to have outliers in the data.

Panel A and Panel B of Table 9.3 provide analyses of the results of the level of operating performance using the operating return on operating assets (OI/OA) and operating return on sales (OI/Sales). Both the median and mean levels of OI/OA of the IPO companies are higher and significantly different at the 1% level to that of their matched companies in the year prior to the IPO and IPO year. But, only the mean level of OI/OA of the IPO companies *over*performs their matched companies significantly at the 5% level in the year immediately after the IPO. While IPO companies continue to *over*perform matched companies in year +2, both median and mean levels are not statistically significantly different. However, IPO companies underperform the matched companies in the third year following the IPOs at the 1% level. These results are confirmed by a significant percentage positive with more (and less) than 50% observed in year -1 and 0 (and year+3).

Table 9.3 The median and mean levels of operating return on operating assets (OI/OA) and operating return on sales (OI/Sales)

Fiscal year relative to IPO	Median level (%)				Mean level (%)				IPO - Matched company		
	IPO company	Matched company	*Difference:* *z*-statistic (p-value)		IPO company	Matched company	*Difference:* *t*-statistic (p-value)		% Positive	*z*-statistic	n
Panel A: OI/OA											
-1	14.28	9.62	6.71[a]	(0.000)	18.02	11.34	5.05[a]	(0.000)	70.08	6.40[a]	254
0	12.91	7.50	7.39[a]	(0.000)	15.08	8.52	4.99[a]	(0.000)	72.83	7.28[a]	254
+1	8.22	6.64	1.52	(0.129)	9.50	6.59	2.30[b]	(0.022)	53.15	1.00	254
+2	6.89	6.27	0.13	(0.896)	6.94	5.72	0.90	(0.370)	49.61	-0.13	254
+3	4.89	6.04	-3.40[a]	(0.001)	1.47	6.88	-2.71[a]	(0.007)	40.16	-3.14[a]	254
Panel B: OI/Sales											
-1	13.93	13.56	0.82	(0.410)	16.32	15.33	2.18[b]	(0.030)	50.39	0.13	254
0	14.25	12.38	4.31[a]	(0.000)	16.92	16.48	0.12	(0.908)	59.84	3.14[a]	254
+1	9.75	10.28	-0.64	(0.525)	11.59	9.00	0.80	(0.423)	45.67	-1.38	254
+2	8.97	10.17	-1.12	(0.261)	8.19	5.37	0.79	(0.430)	44.88	-1.63	254
+3	5.94	9.89	-3.60[a]	(0.000)	-1.90	5.80	-0.81	(0.416)	38.98	-3.51[a]	254

Note:

[a and b] Significantly different from zero at the 0.01 and 0.05 levels, respectively, using a two-tailed test.

Consistent with the results reported for the OI/OA measures, median OI/Sales is also higher for IPO companies compared to their matched companies in year -1 and year 0. However, only performance in year 0 is significantly different at the 1% level. This result is confirmed by a significant percentage positive adjusted OI/Sales of 60% in year 0. Subsequent to year 0, the matched companies seem to dominate the IPO companies, albeit both groups show a decline in performance from year -1 to year +3; however, only year +3 shows a significant IPO underperformance. The percentage positive adjusted OI/Sales at year +3 is only 39%, significantly different from 50%. For comparison with prior studies, the results concerning the operating return on total assets are reported in the Appendix (see Panel A of Table 9.1A). The results are qualitatively similar to those reported for the operating return on operating assets.

Reported in Table 9.4 are the median and mean *changes* in operating return deflated by operating assets (OI/OA). Panel A reports the results on the pre- and post-IPO changes, while Panel B provides the results of the year-to-year changes. Panel A reports that all the median OI/OA values decline from the pre-IPO level. All of them are significantly different from zero at the 1% level. The results are consistent with US studies by Jain and Kini (1994) who found a decline of 9.09% in return on assets three years after the IPO, and by Kim *et al.* (2004).[94]

The matched company numbers exhibit a similar pattern of statistically significant underperformance for the four years, reflecting economy-wide, industry-wide, pre-event performance and size factors. The matched company-adjusted results control for such

[94] Kim *et al.* (2004) report a 71% decline to year +3 from the pre-IPO performance level. The equivalent measure for the present study is a decline of 64%.

factors and show a decline throughout the performance windows examined except for the difference with year 0. The median matched company-adjusted changes range from -0.1% to -8.1% and all (except the first) are statistically significant, indicating that IPO companies have a higher rate of decline than their matched companies. This shows that the decline in post-IPO OI/OA is not simply an industry-effect, a reflection of mean reversion or size related. The decline in OI/OA from year -1 suggests that the IPO companies may time the issues to occur after good performance.

Table 9.4 The median and mean changes in operating return on operating assets (OI/OA)

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre-post-IPO changes (%)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	-1.20[a]	-2.94[b]	-6.06[a]	-8.52[a]	-7.50[a]	-11.08[a]	-10.24[a]	-16.55[a]
p-value	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.000
Matched company	-0.81[a]	-2.82[b]	-2.82[a]	-4.76[a]	-3.60[a]	-5.63[a]	-3.45[a]	-4.46[a]
p-value	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000
Matched company-adjusted	-0.08	-0.11	-4.36[a]	-3.76[b]	-5.87[a]	-5.45[a]	-8.07[a]	-12.09[a]
p-value	0.976	0.942	0.000	0.024	0.000	0.002	0.000	0.000
Panel B:								
Year-to-year changes (%)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	-1.20[a]	-2.94[b]	-4.21[a]	-5.58[a]	-1.42[a]	-2.56[a]	-1.97[a]	-5.47[a]
p-value	0.000	0.011	0.000	0.000	0.000	0.000	0.000	0.001
Matched company	-0.81[a]	-2.82[b]	-0.96[a]	-1.94	-0.34[a]	-0.87	0.07	1.17
p-value	0.000	0.013	0.000	0.146	0.040	0.487	0.675	0.297
Matched company-adjusted	-0.08	-0.11	-3.44[a]	-3.65[b]	-1.84[a]	-1.69	-1.81[a]	-6.64[a]
p-value	0.976	0.942	0.000	0.010	0.006	0.210	0.000	0.001
Number of companies	254	254	254	254	254	254	254	254

Note:

[a and b] Significantly different from zero at the 0.01 and 0.05 levels, respectively, using a two-tailed test.

The year-to-year changes in OI/OA reported in Panel B also show significant declines in performance with the rate of decline slowing somewhat. After controlling for the matched companies within a similar industry, pre-IPO performance and size, the changes in OI/OA still show significant declines except for the change from year -1 to

0. Thus, it is clear that IPOs in Malaysia do show deterioration in accruals-based return on operating assets for the three post-IPO years. Contrary to expectations, this study did not find a large decline in OI/OA in the year -1 to 0, but this was observed in year 0 to +1. To test the robustness of the results, the operating return on total assets was also measured and the results, presented in the Appendix (Table 9.2A), show similar patterns.

Table 9.5 The median and mean changes in operating return on sales (OI/Sales)

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre -post-IPO changes (%)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	0.29	0.60	-2.91[a]	-4.73[a]	-4.46[a]	-8.13[a]	-7.04[a]	-14.42[a]
p-value	0.255	0.115	0.000	0.000	0.000	0.000	0.000	0.000
Matched company	-1.13[a]	1.15	-2.13[a]	-6.33[b]	-3.30[a]	-9.96[a]	-2.59[a]	-9.53[b]
p-value	0.000	0.764	0.000	0.046	0.000	0.001	0.000	0.019
Matched company-adjusted	1.80[a]	-0.55	-1.54	1.60	-2.09	1.83	-4.64[a]	-4.89
p-value	0.000	0.887	0.239	0.621	0.123	0.593	0.000	0.304
Panel B:								
Year-to-year changes (%)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	0.29	0.60	-3.05[a]	-5.33[a]	-0.97[a]	-3.40[a]	-1.65[a]	-6.29[a]
p-value	0.255	0.115	0.000	0.000	0.000	0.003	0.000	0.003
Matched company	-1.13[a]	1.15	-0.77[a]	-7.48[c]	-0.59[b]	-3.63	-0.05	0.43
p-value	0.000	0.764	0.006	0.058	0.030	0.333	0.368	0.920
Matched company-adjusted	1.80[a]	-0.55	-2.90[a]	2.15	-1.12	0.23	-2.16[a]	-6.72
p-value	0.000	0.887	0.000	0.587	0.183	0.952	0.000	0.159
Number of companies	254	254	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

Results for changes in the less downward-biased measure OI/Sales are reported in Table 9.5. Interestingly, as can be observed from Panel A that there is slight improvement in performance in year 0 relative to year -1 for the IPO companies. However, this improvement is not statistically significant. Subsequent to the IPO, there is a significant decline in performance in OI/Sales for both the IPO and matched companies. The

year-to-year changes reported in Panel B indicate that the median OI/Sales for the IPO companies peaks in the IPO year and then declines following the IPO. Consistent with the OI/OA results, the highest decline occurs in the year immediately after the IPO (year 0 to +1).

Table 9.6 The median and mean changes in return on equity

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre- post-IPO changes (%)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	-6.74[a]	-12.46	-13.87[a]	-21.79[b]	-17.61[a]	-27.81[a]	-21.40[a]	-34.41[a]
p-value	0.000	0.138	0.000	0.013	0.000	0.001	0.000	0.004
Matched company	-1.24[a]	2.52	-3.11[a]	-7.42[a]	-4.93[a]	-7.68	-5.75[a]	-10.72
p-value	0.000	0.448	0.000	0.003	0.000	0.024	0.000	0.148
Matched company-adjusted	-5.71[a]	-14.99[c]	-8.49[a]	-14.37	-10.05[a]	-20.13[b]	-15.36[a]	-23.69[c]
p-value	0.000	0.094	0.000	0.113	0.000	0.027	0.000	0.089
Panel B:								
Year-to-year changes (%)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	-6.74[a]	-12.46	-5.35[a]	-9.33[a]	-1.91[a]	-6.02[b]	-2.47[a]	-6.60
p-value	0.000	0.138	0.000	0.000	0.000	0.026	0.000	0.454
Matched company	-1.24[a]	2.52	-1.55[a]	-9.95[a]	-1.00[a]	-0.25	0.11	-3.05
p-value	0.000	0.448	0.000	0.009	0.002	0.951	0.687	0.759
Matched company-adjusted	-5.71[a]	-14.99[c]	-2.61[a]	0.61	-1.06	-5.76	-3.19[a]	-3.55
p-value	0.000	0.094	0.002	0.890	0.118	0.235	0.001	0.788
Number of companies	254	254	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

To confirm the decline in accrual-based measures, the results of the changes in return on equity (ROE) and earnings per share (EPS) are also provided in Tables 9.6 and 9.7. Table 9.6 shows that ROE suffers a larger post-listing fall from the pre-IPO level than OCF/OA and OI/OA measures. The largest fall occurs from year -1 to 0. The results are as expected because the IPO companies have just raised equity but return on extra assets has not had time to impact on operating returns. The year-to-year changes are reported in Panel B to see whether the ROE decline in each post-IPO year. Also

revealed is a significant decline of ROE for the IPO companies and matched company-adjusted but the levels of decline are lower in year +1, +2 and +3 than the one observed in year 0. Summarising the results of Table 9.6, it is clear that the ROE performance of IPO companies deteriorates significantly over time.

Table 9.7 The median and mean changes in earnings per share

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre-post-IPO changes (RM)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	-0.11[a]	20.56	-0.18[a]	20.44	-0.23[a]	20.41	-0.26[a]	20.32
p-value	0.000	0.322	0.000	0.325	0.000	0.326	0.000	0.328
Matched company	0.00[c]	-0.03	-0.03[a]	-0.10[a]	-0.02[a]	-0.11[a]	-0.03[a]	-0.09[a]
p-value	0.087	0.214	0.003	0.001	0.000	0.000	0.003	0.001
Matched company-adjusted	-0.09[a]	20.59	-0.17[a]	20.53	-0.16[a]	20.51	-0.21[a]	20.41
p-value	0.000	0.321	0.000	0.323	0.000	0.323	0.000	0.325
Panel B:								
Year-to-year changes (RM)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	-0.11[a]	20.56	-0.07[a]	-0.12[a]	-0.01[b]	-0.03	-0.02[a]	-0.09[a]
p-value	0.000	0.322	0.000	0.000	0.031	0.240	0.001	0.004
Matched company	0.00[c]	-0.03	0.00	-0.07[b]	0.00	-0.01	0.01	0.01
p-value	0.087	0.214	0.213	0.045	0.221	0.756	0.242	0.515
Matched company-adjusted	-0.09[a]	20.59	-0.08[a]	-0.06	-0.01	-0.02	-0.02[a]	-0.10[a]
p-value	0.000	0.321	0.000	0.165	0.663	0.543	0.005	0.006
Number of companies	254	254	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

Similar to ROE, Panel A of Table 9.7 shows that both median EPS for IPO companies and matched companies significantly decline at the 1% level in the post-IPO. The median adjusted EPS displays a similar pattern of declining performance. From this table, it can also be observed that the declining performance of IPO companies is higher than their matched company counterparts. The year-to-year changes reported in Panel B show that the highest decline in EPS occurs during the IPO year. This might be expected due to the increase in the number of shares outstanding in that year.

In sum, the evidence suggests that the accrual-based operating performance of IPO companies is higher prior to the IPO but declines thereafter, subject to a slight improvement in operating margin in the IPO year (year -1 to 0). This suggests that the IPO companies may time their IPO to coincide with peak performance and/or may increase their assets more rapidly than sales. There is also evident that IPO companies underperform their matched companies from the year following the IPO. Moreover, the evidence is consistent with previous empirical studies (e.g., Jain and Kini, 1994, Khurshed *et al.*, 2003; Kim *et al.*, 2004) which report a deterioration in accrual-based operating performance following IPOs.

The following section presents the results of tests using the cash flow-based operating performance approach.

9.4 Cash flow-based operating performance approach

In addition to investigating accrual-based performance, this study also examines cash flow-based measures to assess the robustness of the results. This may also indicate whether the deterioration in performance in the post-IPO period is due to genuine erosion in operating performance or the reversal of pre-event accruals. As in the previous section, the analysis of the *level* of operating performance for the IPO companies and matched companies is provided first.

Panel A of Table 9.8 reports the median and mean performance *level* of OCF/OA for the year before the IPO (year –1) to the IPO year (year 0) and three years after the IPO (year +1, year +2, and year +3) for the IPO companies and their matched companies. IPO companies marginally *over*perform their matched companies prior to the IPOs but

tend to underperform the matched companies after the IPOs, except in year +2. However, only in year +3 is the median level of OCF/OA of the IPO companies weakly significantly different (at the 10% level) from that of their matched companies. This implies that the performance patterns for the two groups (IPOs and matched companies) are similar in each year, except in the third year following the IPOs. While results based on means show that IPO companies dominate their matched companies in year -1, 0, +1, and +2 but underperform in year +3, none of the differences is statistically significant. This is confirmed by the percentage positive OCF/OA adjusted performance which is also not significantly different from 50% in any of the five years. The results are apparently inconsistent with Cai and Wei (1997), who found that Japanese IPO companies significantly *over*perform their industry median benchmarks for all individual years examined. However, the results are consistent with Cai and Wei's matched company benchmark. The results of the operating cash flow return on total assets are also reported in the Appendix (Panel B of Table 9.1A). These are qualitatively similar to the results based on operating cash flow return on operating assets.

Comparing the results between the levels of accrual-based profit (OI/OA) reported in Table 9.3 and cash flow-based (OCF/OA) reported in Table 9.8, this study found that IPO companies are more outperformed on the accrual-based profit measure than the cash flow-based measure in the pre-IPO year. IPO companies are also found to be more underperformed on the accrual-based measure as compared to cash flow-based in year +3.

It has been highlighted in Chapter 8 that the accounting performance scaled by assets might result in a downward bias after IPOs, due to the large increase in the book value

of assets with no immediate increase in operating cash flows. Therefore, the results of operating cash flow return on sales (OCF/Sales) are also reported in Panel B of Table 9.8. In contrast to the results based on OCF/OA, the results for OCF/Sales are all negative, indicating that the IPO companies performed worse than their matched companies during both pre- and post-IPO periods. The differences in performance are statistically significant at the 1% level in year 0 and +3, at the 5% level in year -1, and at the 10% level in year +1. The percentage positive is significantly different from 50% in year 0, +1, and +3. Based on the results reported in Panel A and B of Table 9.8, there is evidence of underperformance of IPO companies in Malaysia as compared to seasoned companies with the same industry, pre-IPO performance and asset size.

The distorting impact of outliers is illustrated in the results based on mean performance, where no clear patterns or significance occur.[95] Again, comparing the accrual-based measure (OI/Sales) reported in Table 9.3 and cash flow-based (OCF/Sales) reported in Table 9.8, the results confirmed that accrual-based measure display more *over*performance but this is insignificant in the pre-IPO period as compared to the cash flow-based measure. Similarly, more significant underperformance is observed on the accrual-based measure in year +3.

[95] Confirmation that this is an outlier effect was obtained by calculating trimmed means. Using a 20% trimmed mean for year +3 gave the following values: IPOs 12.5%, Matched companies 16.9%, with the differences significant at the 1% level.

Table 9.8 The median and mean levels of operating cash flow return on operating assets (OCF/OA) and operating cash flow return on sales (OCF/Sales)

Fiscal year relative to IPO	Median level (%)				Mean level (%)				IPO - Matched company		
	IPO company	Matched company	*Difference:* z-statistic (p-value)		IPO company	Matched company	*Difference:* t-statistic (p-value)		% Positive	z-statistic	n
Panel A: OCF/OA											
-1	10.72	10.27	1.29	(0.198)	13.77	11.46	1.62	(0.107)	54.33	1.38	254
0	8.70	9.21	-0.31	(0.760)	10.63	9.98	0.49	(0.623)	47.24	-0.88	254
+1	8.70	9.98	-0.97	(0.333)	10.88	10.85	0.02	(0.984)	47.24	-0.88	254
+2	9.73	8.37	0.04	(0.966)	10.03	9.60	0.37	(0.715)	50.39	0.13	254
+3	8.35	9.21	-1.83[c]	(0.067)	8.88	9.99	-0.89	(0.375)	44.88	-1.63	254
Panel B: OI/Sales											
-1	10.54	14.44	-2.18[b]	(0.030)	13.68	15.67	-1.01	(0.314)	46.06	-1.26	254
0	9.16	13.38	-2.69[a]	(0.007)	12.65	12.39	0.07	(0.941)	41.34	-2.76[a]	254
+1	11.21	15.72	-1.83[c]	(0.068)	15.25	15.75	-0.20	(0.840)	42.52	-2.38[b]	254
+2	10.88	14.07	-0.59	(0.558)	13.83	11.55	0.70	(0.487)	48.03	-0.63	254
+3	11.66	15.08	-3.12[a]	(0.002)	16.80	14.35	0.46	(0.649)	38.98	-3.51[a]	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

Table 9.9 reports both the median and mean *changes* of OCF/OA for IPO companies, matched companies and matched company-adjusted. Panel A provides evidence of a statistically significant (at the 1% level) decline in performance for IPO companies from the year prior to the IPO (year -1) to year 0, +1, +2, and +3. Matched companies show only weakly significant declines in performance from year -1 to +2, and from year -1 to +3, so IPOs significantly underperform matched companies for all years except the period to year +2.

Table 9.9 The median and mean changes in operating cash flow return on operating assets (OCF/OA)

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre-post-IPO changes (%)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	-2.94[a]	-3.14[b]	-2.38[a]	-2.89[b]	-2.32[a]	-3.74[a]	-2.89[a]	-4.89[a]
p-value	0.001	0.028	0.006	0.042	0.005	0.004	0.000	0.000
Matched company	-0.11	-1.48	0.09	-0.61	-1.26[c]	-1.86[c]	-1.64[c]	-1.47
p-value	0.239	0.155	0.784	0.543	0.063	0.077	0.075	0.193
Matched company-adjusted	-2.81[c]	-1.66	-4.00[b]	-2.28	-3.67	-1.88	-2.10[b]	-3.42[c]
p-value	0.070	0.351	0.030	0.202	0.147	0.269	0.033	0.054
Panel B:								
Year-to-year changes (%)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	-2.94[a]	-3.14[b]	-0.77	0.25	-0.43	-0.85	-0.48	-1.15
p-value	0.001	0.028	0.978	0.855	0.845	0.489	0.151	0.267
Matched company	-0.11	-1.48	0.69	0.88	-0.23	-1.25	0.03	0.39
p-value	0.239	0.155	0.289	0.372	0.151	0.155	0.465	0.670
Matched company-adjusted	-2.81[c]	-1.66	-2.06	-0.62	1.05	0.40	-2.37	-1.55
p-value	0.070	0.351	0.315	0.723	0.342	0.792	0.102	0.270
Number of companies	254	254	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

The year-to-year performance for IPO companies shows a decline in all four years but only the median decline of 2.9% in year -1 to 0 is statistically significant (at the 1% level). The median year-to-year changes for the matched companies are all smaller than for IPO companies, with two small improvements and two years of decline; all changes

are statistically insignificant. IPOs underperform against control group but only statistically significant in year -1 to 0 at the 10% level. Results based on means are broadly similar though generally less significant. The operating cash flow return on total assets (OCF/TA) was also measured and the results, reported in Appendix (Table 9.3A), show similar patterns.

The results for changes of OCF/Sales, reported in Table 9.10 provide contrasting results. As can be observed from Panel A, even though there is some evidence of decline in post-IPO performance relative to the pre-IPO level, this is not statistically significant except for the decline to year 0 for the IPO companies. The year-to-year changes reported in Panel B of this table also show insignificant median declines, except from year -1 to 0 for IPO companies. Comparing the results when operating assets and total sales are used as the denominator, the results support the argument that post-IPO accounting performance deflated by assets suffers from a downward bias (Barber and Lyon, 1996; Mikkelson *et al.*, 1997).

It is clear that both accrual performance measures show higher pre-IPO performance, consistent with Kim *et al.*'s (2004) study on the Thailand market. Post-IPOs, there is evidence of IPO companies underperforming relative to their matched companies. This is consistent with the Mikkelson *et al.*'s (1997) study on the US market and Cai and Wei's (1997) findings on the Japanese market. There is also a much steeper decline in performance relative to the pre-IPO year when accrual-based measures are used. The year-to-year change confirmed that the accrual-based measures show more significant decline from the previous year. The largest fall in accrual-based measure occurs from year 0 to +1. On the hand, the largest fall in cash flow-based measure occurs from year -1 to +0. Overall, the results suggest that both accrual- and cash flow-based measures

deteriorate following Malaysian IPOs. Comparing the results between the accrual- and cash flow-based measures suggests that erosion in operating performance may be the result of the reversal of pre-event accruals that have been used by IPO managers to overstate pre-IPO earnings.

Table 9.10 The median and mean changes in operating cash flow return on sales (OCF/Sales)

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre- post-IPO changes (%)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	-1.76[b]	-1.03	0.06	1.57	-0.23	0.15	-0.70	3.12
p-value	0.049	0.570	0.890	0.382	0.895	0.946	0.729	0.436
Matched company	-0.02	-3.28	1.06	0.08	-0.65	-4.12	0.11	-1.32
p-value	0.948	0.330	0.388	0.972	0.298	0.158	0.227	0.766
Matched company-adjusted	-1.11	2.25	-0.92	1.49	0.98	4.27	-3.78	4.44
p-value	0.213	0.556	0.689	0.601	0.570	0.237	0.134	0.444
Panel B:								
Year-to-year changes (%)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	-1.76[b]	-1.03	0.42	2.60	0.26	-1.42	-0.14	2.97
p-value	0.049	0.570	0.109	0.179	0.897	0.512	0.866	0.428
Matched company	-0.02	-3.28	1.02	3.36	-0.17	-4.19	0.56[c]	2.80
p-value	0.948	0.330	0.392	0.179	0.139	0.128	0.074	0.542
Matched company-adjusted	-1.11	2.25	-0.34	-0.75	2.51	2.78	-2.37	0.17
p-value	0.213	0.556	0.999	0.821	0.272	0.435	0.142	0.976
Number of companies	254	254	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

The next section provides an analysis of the potential sources of operating performance changes.

9.5 Sources of changes in operating performance

To further investigate accounting-based operating performance, this study also examines a variety of potential sources of deterioration in post-IPO operating

performance. Jain and Kini (1994) find that companies have high growth in sales and capital expenditure even though their performance declines following IPOs. The present study considers whether the growth in sales, capital expenditure, and asset turnover patterns of IPO companies changes over time. This could provide some of the reasons for the observed inferior operating performance of IPO companies in the three years following IPOs.

Due to the skewness of the data, the results on growth in sales, capital expenditure, and asset turnover focus on medians. For example, inspection of the data reveals that there are eight IPO companies and one matched company having a percentage growth rate in sales of more than 1000% for individual observations in the post IPO period. The high value of the growth rate in sales may be due to very low sales in the benchmark year. For example, one outlier company has total sales of RM19 million in year -1, rising to RM125 million by year +1, thereby producing a growth rate of 560%. However, for completeness, the results based on means are also reported.

9.5.1 Growth in sales

Table 9.11 reports the median and mean percentage change (growth) in sales. With respect to the sales growth from the pre-IPO year, this study discovers that IPO companies have significantly higher growth in sales than their matched companies, over time. However, this study makes an improvement on the analysis by looking at the year-to-year growth in sales and finds that IPO companies perform in line with matched companies except in the pre-IPO period. The results of the year-to-year changes suggest that the increase in sales for IPO companies can be attributed exclusively to

industry, mean reversion, and size effects, which is not consistent with the studies by Jain and Kini (1994), Chan *et al.* (2003), and Kim *et al.* (2004).

Table 9.11 The median and mean growth in sales

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre-post-IPO growth (%)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	17.83[a]	30.39[a]	27.13[a]	52.20[a]	40.05[a]	78.49[a]	46.55[a]	81.11[a]
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Matched company	13.42[a]	16.41[a]	21.97[a]	37.01[a]	25.98[a]	45.02[a]	33.48[a]	48.97[a]
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Matched company-adjusted	7.31[a]	13.98[b]	7.31	15.19	15.96[b]	33.47[b]	16.32[a]	32.13[b]
p-value	0.007	0.011	0.113	0.125	0.027	0.044	0.005	0.013
Panel B:								
Year-to-year growth (%)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	17.83[a]	30.39[a]	8.70[a]	12.76[a]	8.21[a]	22.76[c]	4.66[a]	8.12[a]
p-value	0.000	0.000	0.000	0.000	0.000	0.060	0.000	0.000
Matched company	13.42[a]	16.41[a]	9.00[a]	24.52[a]	6.79[a]	8.70[a]	7.02[a]	2.47
p-value	0.000	0.000	0.000	0.000	0.001	0.001	0.002	0.698
Matched company-adjusted	7.31[a]	13.98[b]	0.07	-11.76	0.73	14.06	0.87	5.65
p-value	0.007	0.011	0.816	0.106	0.282	0.255	0.266	0.399
Number of companies	254	254	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

9.5.2 Changes in capital expenditure

A reduction in post-IPO operating performance may be due to companies cutting back on capital expenditure. Panel A of Table 9.12 reports a significant increase in capital expenditure from the pre-IPO year for all windows examined, for both IPO and matched companies. The year-to-year changes in capital expenditure reported in Panel B reveal that capital expenditure increased during the IPO year and a year subsequent to the IPO. However, the companies marginally cutback their capital expenditure from two years after they went public.

Table 9.12 The median and mean changes in capital expenditure

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre-post-IPO changes (%)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	31.50[a]	238.00[a]	48.10[a]	585.09[b]	20.50[a]	647.79[b]	20.60[a]	524.42[b]
p-value	0.000	0.000	0.000	0.014	0.000	0.023	0.000	0.025
Matched company	5.35[a]	816.09	1.88[a]	335.61[a]	6.05[a]	404.98[a]	6.99[a]	333.17[a]
p-value	0.004	0.195	0.001	0.002	0.006	0.001	0.000	0.002
Matched company-adjusted	23.60[b]	-584.20	29.90[a]	247.07	11.50	239.57	5.93	188.55
p-value	0.011	0.359	0.002	0.343	0.137	0.440	0.559	0.465
Panel B:								
Year-to-year changes (%)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	31.50[a]	238.00[a]	5.79[a]	375.66	-7.74	229.97	-3.68	92.51[a]
p-value	0.000	0.000	0.001	0.205	0.187	0.147	0.302	0.000
Matched company	5.35[a]	816.09	-6.81[c]	323.73[a]	-5.72	122.35[a]	-5.11	370.11[c]
p-value	0.004	0.195	0.096	0.006	0.512	0.005	0.139	0.070
Matched company-adjusted	23.60[b]	-584.20	13.50	51.94	-1.80	107.62	-9.37	-276.94
p-value	0.011	0.359	0.316	0.871	0.972	0.513	0.475	0.178
Number of companies	252	252	254	254	254	254	253	253

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

9.5.3 Changes in asset turnover

Asset turnover is usually used to indicate a company's efficiency in the use of its assets to generate sales. Table 9.13 shows that the median change of asset turnover is significantly negative at the 1% level, both pre- and post-IPO. IPO companies perform poorly compared with their matched companies over the four-year window from -1 to +3. Asset turnover falls by 30.3% for IPOs compared with a fall of 15.7% for matched companies. The decline in asset turnover from year -1 to year +3 indicates that IPO companies increase their assets much faster than their sales. This finding is consistent with the earlier results on the accrual-based operating performance measure, which showed a higher rate of decline when assets rather than sales were used as the denominator. With a large increase in assets and relatively low increase in sales, the original level of efficiency cannot be maintained.

Table 9.13 The median and mean changes in asset turnover

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre-post-IPO changes (%)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	-12.18[a]	-4.40	-18.71[a]	-6.63	-26.39[a]	-11.56[b]	-30.27[a]	-15.75[a]
p-value	0.000	0.198	0.000	0.190	0.000	0.024	0.000	0.003
Matched company	-2.94	-2.98	-7.84[b]	-2.88	-13.49[a]	-5.60[c]	-15.65[a]	-13.51[a]
p-value	0.062	0.146	0.033	0.270	0.002	0.063	0.000	0.000
Matched company-adjusted	-9.99[a]	-1.42	-14.18[a]	-3.75	-9.58[a]	-5.96	-8.36[a]	-2.25
p-value	0.009	0.730	0.000	0.513	0.000	0.312	0.008	0.717
Panel B:								
Year-to-year changes (%)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	-12.18[a]	-4.40	-6.37[a]	-5.29[a]	-3.91[a]	-5.04[a]	-2.31[b]	-1.99
p-value	0.000	0.198	0.000	0.000	0.000	0.004	0.022	0.371
Matched company	-2.94[c]	-2.98	-2.93	4.42[c]	-5.16[b]	0.39	-3.88[a]	-12.12[b]
p-value	0.062	0.146	0.750	0.095	0.032	0.868	0.000	0.047
Matched company-adjusted	-9.99[a]	-1.42	-6.36[a]	-9.71[a]	-3.06	-5.43[c]	3.98	10.13
p-value	0.009	0.730	0.004	0.002	0.164	0.062	0.141	0.144
Number of companies	254	254	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

The year-to-year changes indicate that the decline attenuates up to year +2, while for year +3 IPO companies perform approximately in line with their matched companies. The decline in asset turnover is consistent with the findings of Jain and Kini (1994), Chan *et al.* (2003), and Kim *et al.* (2004).

In sum, the results of growth in sales and capital expenditure do not fully explain the poorer operating performance of Malaysian companies following IPOs. However, asset turnover partially explains the poorer operating performance.

9.6 Changes in market expectations

Potential investors may have high expectations of earnings growth due to either window-dressing of financial statements by managers prior to the IPO or to managers

timing the offering when their performance is better (Jain and Kini, 1994). To investigate this possibility, two measures of investor expectations (market-to-book assets and market-to-book equity) were considered. The market expectations' measures are reported from year 0 since there is no price information prior to going public.

Table 9.14 reports the results of median and mean changes of the market-to-book ratio of assets (MTBA) for years +1 to +3. Panel A shows that the MTBA of IPO companies declines considerably over time; on the other hand there is only a moderate decline in MTBA for matched companies. Thus, the matched company-adjusted MTBA is significantly negative for years +1 to +3 relative to year 0. The year-to-year results show that the significant negative adjusted performance actually occurs in the first post-IPO year (year 0 to +1). The change from year +1 to +2 shows a slight improvement, but declines again in year +3. To assess the robustness of this market expectation measure, an alternative measure was employed: the market-to-book ratio of equity (MTBE), and the results are reported in the Appendix (Table 9.4A). Broadly similar patterns were observed.

The overall results suggest that the market expectation measures start with a higher performance[96] but decline significantly over time from the pre-IPO level. However, the year-to-year changes indicate that the decline occurs mainly in year +1. To sum up, these results are consistent with Jain and Kini's (1994) findings which suggest that by observing the performance at the pre-IPO level, investors have developed an optimistic

[96] The median MTBA (MTBE) ratios for IPO company are 2.23 (2.58) in year 0, decline to 1.68 (1.98), 1.48 (1.72), 1.24 (1.38) in years +1, +2, and +3 respectively. The median MTBA (MTBE) ratios for matched company are 1.70 (1.97), 1.45 (1.67), 1.28 (1.35), 1.23 (1.31) in years +1, +2, and +3 respectively.

judgment of earnings growth for IPO companies, but these expectations are not sustained.

Table 9.14 The median and mean changes in market-to-book assets

	Median	Mean	Median	Mean	Median	Mean
Panel A:						
Pre-post-IPO changes (ratio)	***Year 0 to +1***		***Year 0 to +2***		***Year 0 to +3***	
IPO company	-0.14[a]	-0.34[b]	-0.31[a]	-0.44[a]	-0.60[a]	-0.66[a]
p-value	0.000	0.010	0.000	0.002	0.000	0.000
Matched company	-0.09[a]	-0.21[b]	-0.26[a]	-0.25[b]	-0.31[a]	-0.45[a]
p-value	0.001	0.033	0.000	0.023	0.000	0.000
Matched company-adjusted	-0.17[c]	-0.13	-0.21[c]	-0.19	-0.36[a]	-0.21
p-value	0.061	0.388	0.067	0.245	0.002	0.222
Panel B:						
Year-to-year changes (ratio)	***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	-0.14[a]	-0.34[b]	0.00	-0.10	-0.07[b]	-0.23
p-value	0.000	0.010	0.698	0.387	0.013	0.129
Matched company	-0.09[a]	-0.21[b]	-0.05[c]	-0.04	-0.06[b]	-0.20[a]
p-value	0.001	0.033	0.057	0.599	0.011	0.004
Matched company-adjusted	-0.17[c]	-0.13	0.05	-0.06	-0.06	-0.02
p-value	0.061	0.388	0.756	0.682	0.204	0.893
Number of companies	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

9.7 Changes in leverage

In addition to investigating the sources of operating performance, and changes in market expectations, the change in leverage is also analysed to assess the impact of the capital structure decisions of the companies. Results for the leverage ratio measured as total debt to total assets (TD/TA) are reported in Table 9.15.

IPO companies significantly reduce their leverage in absolute terms, and relative to the control group, in the IPO year. In post-IPO years, IPO companies increase gearing, relative to matched companies, by a small but significant percentage. Similar results

were found using the debt-to-equity ratio (see Appendix, Table 9.5A). The results indicate that IPO companies reduce their leverage in the year of going public. This is one of the reasons why companies go public as the gross proceeds obtained from issuing equity can be used to repay some of their borrowings. The small increase in the leverage ratio post-IPO is consistent with companies seeking to obtain the benefit of interest tax shields which may increase their value. Overall, this result is consistent with Mikkelson *et al.*'s (1997) finding that leverage ratios of US IPOs dropped from year -1 to year + 1 but increased thereafter. However, the results are in contrast to evidence on UK IPOs in which leverage ratios were observed to decrease at the time of IPOs but remained lower in the post IPO period (Khurshed *et al.*, 2003).

Table 9.15 The median and mean changes in total debt to total assets (TD/TA)

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre-post-IPO changes (%)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	-4.18[a]	-6.51[a]	-1.57[c]	-1.24	0.66	0.44	1.33[a]	3.55[c]
p-value	0.000	0.000	0.090	0.598	0.158	0.810	0.003	0.069
Matched company	0.61[a]	3.19[a]	1.10[a]	3.36[a]	0.46[a]	4.60[a]	1.57[a]	3.55[a]
p-value	0.000	0.000	0.003	0.004	0.002	0.001	0.002	0.003
Matched company-adjusted	-6.42[a]	-9.70[a]	-3.59[a]	-4.61[c]	-1.28	-4.16[c]	0.75	-0.01
p-value	0.000	0.000	0.003	0.058	0.225	0.062	0.828	0.998
Panel B:								
Year-to-year changes (%)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	-4.18[a]	-6.51[a]	1.00[a]	5.26[a]	0.69[a]	1.69	0.97[a]	3.11[a]
p-value	0.000	0.000	0.000	0.002	0.000	0.305	0.000	0.000
Matched company	0.61[a]	3.19[a]	0.00	0.17	0.00	1.23	-0.02	-1.04
p-value	0.000	0.000	0.281	0.854	0.134	0.258	0.833	0.410
Matched company-adjusted	-6.42[a]	-9.70[a]	1.57[a]	5.09[a]	1.90[b]	0.45	1.74[a]	4.15[a]
p-value	0.000	0.000	0.001	0.004	0.026	0.804	0.002	0.006
Number of companies	254	254	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

The next part provides the univariate and multivariate analyses of post-IPO operating performance to determine whether family relationships, retained ownership and underpricing provide further explanations of the changes observed in operating performance.

Part 3 Post-IPO performance: Univariate and multivariate analyses of family relationships, retained ownership and underpricing

9.8 Family relationships and post-IPO operating performance

Prior research has suggested that there may be a link between family involvement and company performance (Anderson and Reeb, 2003). In the present study, 246 companies have prospectuses (8 of the original sample of 254 were missing). Of these 246 companies, 164 had family involvement in senior management prior to the IPOs and 82 companies had no family involvement. Table 9.16 shows the median change in operating performance for the post-IPO period relative to the pre-IPO year for both groups. Overall, the table provides no (or very little) evidence of family involvement affecting post-IPO performance.

9.9 Retained ownership and post-IPO operating performance

The association between retained ownership and post-IPO operating performance is examined to see whether there is a positive link between them, as suggested by Leland and Pyle (1977) and Downes and Heinkel (1982). Similar to Jain and Kini (1994) and Khurshed *et al.* (2003), the median retained ownership (alpha) is used to split the sample between low ownership and high ownership. With a median alpha of 79.2%, each group consists of 127 companies.

As revealed in Table 9.17, using accrual-based profit measures, the high retained ownership group displays poorer post-IPO performance than the low ownership group, with the difference being statistically significant. For example, the median change of OI/Sales in year +3 from year -1 for the low ownership group is -5.7% and -9.0% for the high retained ownership group over the same period. However, this differential performance disappears when matched company-adjusted measures are used. These accrual-based results in Malaysia are in contrast to the better performance for high ownership groups found for the US by Jain and Kini (1994), and the UK by Khurshed *et al.* (2003). There is no real pattern in the difference in cash flow-based operating performance between low ownership and high ownership groups.

Due to the high median percentage of retained ownership (alpha) on the Malaysian market, the present study also used quartiles' alpha value to split the sample, as a robustness check. Q1 refers to the low ownership retention group (alpha below 73.08%) and Q4 refers to the high ownership retention group (alpha above 84.94%). Each group consists of 63 companies. The results are presented in the Appendix (Table 9.6A) and show qualitatively similar to those reported using median alpha.

9.10 Underpricing and post-IPO operating performance

To test the signalling theory of underpricing, the association between underpricing and post-IPO operating performance is also investigated and reported in Table 9.18. The present study expects to observe a positive association between underpricing and post-IPO operating performance. Following Jain and Kini (1994), and Khurshed *et al.* (2003) the sample of Malaysian IPOs is split into two sub-samples based on median

underpricing. The median underpricing for the sample of 254 IPOs is 85.5%. Each group consists of 127 IPO companies.

Based on the change measures of accrual-based performance the results show that both of the low and high underpricing groups experience a decline in performance in the post IPO period. There is a tendency for the high underpricing group to show inferior accrual-based operating performance in the long run. However, there is an opposite pattern seen in the cash flow-based performance measure. The high underpricing group show superior cash-flow-based operating performance in the long run, with the difference between them being statistically significant. Thus, the cash flow-based performance results provide support for the signalling model of underpricing. However, the evidence on the accrual-based performance measure is in line with the studies of Jain and Kini (1994) and Khurshed *et al.* (2003), which conclude that underpricing has insignificant explanatory power in predicting operating performance following IPOs.

Table 9.16 Operating performance of IPOs based on family relationships

Operating performance	Family group	IPO company				Matched company-adjusted			
		-1 to 0	-1 to +1	-1 to +2	-1 to +3	-1 to 0	-1 to +1	-1 to +2	-1 to +3
OI/OA	Non-family relationships	-1.39	-4.01	-6.47	-8.62	-1.65	-3.85	-5.05	-7.38
	Family relationships	-0.92	-6.75	-8.13	-10.78	0.42	-4.39	-6.25	-8.19
	z-statistic for difference	0.13	-0.65	-1.23	-1.35	0.74	-0.07	-0.10	-0.07
	p-value	0.897	0.517	0.220	0.177	0.457	0.942	0.917	0.945
OI/Sales	Non-family relationships	0.26	-1.82	-2.50	-4.34	1.87	-1.45	-0.76	-3.66
	Family relationships	0.29	-3.33	-5.01	-8.02	1.67	-1.44	-1.69	-4.72
	z-statistic for difference	0.67	-0.90	-2.18[b]	-2.69[a]	-0.50	1.15	-0.51	-0.09
	p-value	0.505	0.366	0.029	0.007	0.620	0.251	0.609	0.926
OCF/OA	Non-family relationships	-2.79	0.86	-1.03	-0.64	-2.56	-4.67	-3.19	-2.84
	Family relationships	-2.69	-3.56	2.93	-3.40	-2.35	-3.42	-3.96	-1.03
	z-statistic for difference	0.10	-1.74[c]	0.60	-0.18	0.04	0.10	-0.59	1.07
	p-value	0.920	0.082	0.546	0.858	0.968	0.920	0.558	0.285
OCF/Sales	Non-family relationships	-3.19	2.90	0.20	-0.87	-1.52	-0.39	-1.05	-6.38
	Family relationships	-1.52	-0.94	-0.76	-0.49	-0.61	-0.77	1.63	-0.87
	z-statistic for difference	0.24	-1.77[c]	-1.11	0.03	0.07	-0.83	0.57	2.01[b]
	p-value	0.808	0.076	0.269	0.979	0.942	0.408	0.570	0.044
Number of companies		246	246	246	246	246	246	246	246

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

Table 9.17 Operating performance of IPOs based on retained ownership

Operating performance	Retained ownership group	IPO company				Matched company-adjusted			
		-1 to 0	-1 to +1	-1 to +2	-1 to +3	-1 to 0	-1 to +1	-1 to +2	-1 to +3
OI/OA	'Low' ownership	-0.62	-4.03	-5.76	-8.83	-0.33	-4.36	-4.01	-7.33
	'High' ownership	-1.70	-7.35	-8.65	-11.60	0.23	-4.35	-7.49	-9.58
	z-statistic for difference	-1.86[c]	-2.53[b]	-2.17[b]	-2.40[b]	0.13	0.06	-1.67[c]	-1.44
	p-value	0.063	0.011	0.030	0.016	0.893	0.949	0.095	0.149
OI/Sales	'Low' ownership	0.40	-1.71	-3.05	-5.72	1.79	-2.82	-0.96	-3.17
	'High' ownership	-0.03	-4.34	-5.76	-9.04	1.85	0.19	-2.22	-5.12
	z-statistic for difference	-0.06[c]	-2.50[b]	-0.03[b]	-2.69[a]	0.33	1.32	-0.39	-1.05
	p-value	0.058	0.012	0.033	0.007	0.330	0.188	0.391	0.292
OCF/OA	'Low' ownership	-2.57	-3.43	-2.16	-2.82	-2.48	-5.56	-3.88	-2.14
	'High' ownership	-3.73	-1.17	-2.45	-2.95	-3.42	-0.96	-3.50	-1.97
	z-statistic for difference	-0.78	0.81	-0.07	-0.75	-0.43	1.58	0.55	0.37
	p-value	0.435	0.420	0.941	0.455	0.666	0.113	0.582	0.710
OCF/Sales	'Low' ownership	-1.51	-1.06	-0.22	-0.06	-2.38	-3.19	-0.91	-3.87
	'High' ownership	-2.51	0.72	-0.24	-1.17	-0.82	1.65	1.75	-3.05
	z-statistic for difference	-0.78	0.84	-0.58	-0.72	0.93	1.37	0.80	0.52
	p-value	0.435	0.403	0.562	0.474	0.352	0.172	0.423	0.605
Number of companies		254	254	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

Table 9.18 Operating performance of IPOs based on underpricing

Operating performance	Median underpricing group	IPO company				Matched company-adjusted			
		-1 to 0	-1 to +1	-1 to +2	-1 to +3	-1 to 0	-1 to +1	-1 to +2	-1 to +3
OI/OA	'Low' underpricing	-1.70	-5.24	-6.11	-9.24	-0.45	-4.20	-5.01	-7.75
	'High' underpricing	-0.52	-7.14	-8.65	-11.90	0.42	-4.36	-6.46	-8.83
	z-statistic for difference	0.67	-1.22	-1.90[c]	-1.28	0.76	-0.84	-0.45	-0.09
	p-value	0.505	0.224	0.058	0.199	0.445	0.402	0.655	0.927
OI/Sales	'Low' underpricing	0.17	-2.41	-3.69	-6.35	1.85	-1.60	-0.96	-4.61
	'High' underpricing	0.32	-3.91	-6.17	-7.16	1.79	-1.52	-2.75	-4.77
	z-statistic for difference	0.07	-2.00[b]	-2.74[a]	-1.15	-0.58	1.11	-0.92	-0.07
	p-value	0.946	0.046	0.006	0.252	0.564	0.268	0.358	0.945
OCF/OA	'Low' underpricing	-2.58	-0.94	-2.53	-5.73	-5.41	-5.37	-4.20	-7.21
	'High' underpricing	-3.67	-3.37	-2.13	-0.50	-0.68	-1.65	-1.55	0.11
	z-statistic for difference	-0.05	-0.05	1.11	2.29[b]	1.92[c]	1.81[c]	1.36	2.59[a]
	p-value	0.958	0.958	0.267	0.022	0.055	0.070	0.174	0.009
OCF/Sales	'Low' underpricing	-1.06	0.72	-0.95	-2.63	-2.34	-1.83	0.20	-6.22
	'High' underpricing	-2.51	-0.88	0.69	0.83	0.13	0.81	3.94	0.74
	z-statistic for difference	-0.15	-0.78	0.66	1.66[c]	1.54	1.42	1.04	1.80[c]
	p-value	0.877	0.435	0.507	0.096	0.123	0.156	0.296	0.072
Number of companies		254	254	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

9.11 Multivariate analysis of family relationships, retained ownership, underpricing and post-IPO operating performance

To complement the univariate analysis in Sections 9.8, 9.9 and 9.10, this section also presents the multivariate analysis of the relationship between the explanatory variables (family relationships, retained ownership and underpricing) and the dependent variables (raw and adjusted operating performance post-IPO). Dummy variables are used to represent companies with family relationships, high retained ownership and high underpricing. The results are reported in Table 9.19.

Focusing first on the family relationships variable, only the change from year -1 to +1 using the accrual-based measure (OI/Sales) is found to show a significant (at the 5% level) negative relationship with the post-IPO matched-company adjusted performance. The result confirms the conclusion from the univariate analysis that there is very little evidence of family involvement affecting post-IPO performance.

With regard to the retained ownership variable, the result also confirms the conclusion from the univariate analysis that there is a significant negative relationship (at the 5% and 10% levels) between retained ownership and the change in post-IPO performance from year -1 to +3, using the accrual-based measure. Similarly, no clear pattern in the relationship between retained ownership and the cash flow-based performance measure, post-IPO, is observed.

The underpricing variable shows a weak (at the 10% level) positive relationship with post-IPO performance, after adjusting for the matched company performance. The significant relationship can only be observed when the cash flow-based performance

measures are employed. With the highest Adjusted R-Square value of 0.022, using the OCF/OA measure after adjusting for the matched company performance, all of these three variables (family relationships, retained ownership and underpricing) can only explain 2.2% of the change in the post-IPO performance.[97]

The present study also employed the percentage values of retained ownership and underpricing, rather than using a dummy ('1' or '0') for these explanatory variables. These results are reported in the Appendix (Table 9.7A). Interestingly, similar (or even weaker) results are observed.

[97] To assess the robustness of the results, a univariate regression and a regression using a combination of two independent variables (family relationships and/or retained ownership and/or underpricing) were performed. All of the explanatory variables, with the exception of underpricing, have insignificant relationships (based on using the adjusted change in OCF/OA from year -1 to +3 as the dependent variable).

Table 9.19 Multivariate analysis of family relationships, retained ownership, underpricing and post-IPO operating performance

	$Perf._{-1to0}$	$Perf._{-1to+1}$	$Perf._{-1to+2}$	$Perf._{-1to+3}$	$PerfAdj._{-1to0}$	$PerfAdj._{-1to+1}$	$PerfAdj._{-1to+2}$	$PerfAdj._{-1to+3}$
Panel A: OI/OA								
Intercept	-1.623 (-0.87)	-5.544 (-3.02)[a]	-7.972 (-4.04)[a]	-9.775 (-3.83)[a]	0.823 (0.36)	-0.401 (-0.14)	-3.721 (-1.47)	-8.000 (-2.74)[a]
FAMILYR	-0.272 (-0.12)	-0.582 (-0.24)	-0.348 (-0.14)	-3.154 (-0.86)	-1.212 (-0.40)	-5.846 (-1.34)	-0.255 (-0.08)	-1.116 (-0.28)
ALPHA	-4.265 (-1.91)[c]	-5.401 (-2.19)[b]	-4.911 (-1.90)[c]	-10.825 (-2.63)[a]	-0.669 (-0.22)	-0.226 (-0.06)	-4.761 (-1.55)	-10.044 (-2.26)[b]
UNDPRC	2.010 (0.85)	0.297 (0.11)	-0.854 (-0.32)	1.261 (0.28)	0.385 (0.12)	1.342 (0.38)	0.317 (0.10)	3.607 (0.75)
Adjusted R^2	0.004	0.006	0.002	0.016	-0.012	-0.001	-0.002	0.009
Panel B: OI/Sales								
Intercept	1.776 (2.37)[b]	-0.400 (-0.28)	-0.473 (-0.18)	-0.603 (-0.16)	7.618 (1.30)	11.227 (1.90)[c]	10.005 (1.58)	-1.047 (-0.18)
FAMILYR	-0.686 (-0.81)	-0.863 (-0.47)	-0.486 (-0.17)	-10.334 (-1.86)[c]	-5.444 (-1.11)	-20.119 (-2.05)[b]	-4.227 (-0.55)	1.951 (0.20)
ALPHA	-1.128 (-1.42)	-2.801 (-1.55)	-4.283 (-1.56)	-8.242 (-1.54)	-0.893 (-0.12)	6.242 (0.85)	-7.806 (-1.03)	-18.417 (-1.74)[c]
UNDPRC	-0.235 (-0.30)	-4.490 (-2.64)[a]	-10.230 (-3.68)[a]	-5.461 (-0.98)	-8.541 (-1.09)	1.367 (0.19)	-3.213 (-0.48)	9.921 (1.04)
Adjusted R^2	0.001	0.029	0.055	0.019	-0.005	0.021	-0.004	0.006

continued on next page

Table 9.19 (*continued*) **Multivariate analysis of family relationships, retained ownership, underpricing and post-IPO operating performance**

	$Perf._{-1to0}$	$Perf._{-1to+1}$	$Perf._{-1to+2}$	$Perf._{-1to+3}$	$PerfAdj._{-1to0}$	$PerfAdj._{-1to+1}$	$PerfAdj._{-1to+2}$	$PerfAdj._{-1to+3}$
Panel C: OCF/OA								
Intercept	-4.616 (-1.48)	-2.724 (-0.81)	-6.398 (-2.09)[b]	-8.702 (-2.69)[a]	-6.721 (-1.73)[c]	-4.957 (-1.15)	-6.843 (-1.75)[c]	-9.787 (-2.36)[b]
FAMILYR	1.771 (0.52)	-2.229 (-0.69)	0.517 (0.17)	2.606 (0.85)	0.572 (0.14)	-1.851 (-0.44)	2.622 (0.68)	4.908 (1.21)
ALPHA	-0.204 (-0.07)	1.991 (0.71)	0.477 (0.18)	-2.344 (-0.86)	3.756 (1.02)	3.319 (0.92)	2.723 (0.78)	-2.215 (-0.62)
UNDPRC	0.999 (0.33)	0.960 (0.33)	3.801 (1.44)	6.435 (2.41)[b]	5.797 (1.58)	5.198 (1.42)	3.739 (1.08)	8.820 (2.48)[b]
Adjusted R^2	-0.010	-0.009	-0.003	0.017	0.003	-0.001	-0.002	0.022
Panel D: OCF/Sales								
Intercept	-0.839 (-0.26)	2.520 (0.71)	1.486 (0.29)	2.778 (0.50)	-5.757 (-0.78)	0.339 (0.05)	-1.273 (-0.16)	-2.890 (-0.26)
FAMILYR	-1.972 (-0.42)	-6.188 (-1.39)	-1.977 (-0.34)	-11.124 (-0.82)	-6.974 (-0.97)	-9.512 (-1.44)	1.751 (0.23)	-10.703 (-0.63)
ALPHA	2.805 (0.74)	5.572 (1.50)	-4.505 (-0.99)	5.211 (0.53)	14.266 (1.97)[b]	7.803 (1.35)	4.307 (0.61)	7.009 (0.56)
UNDPRC	0.867 (0.23)	1.672 (0.45)	4.796 (1.16)	10.917 (1.21)	12.745 (1.68)[c]	8.816 (1.52)	5.582 (0.80)	23.470 (1.85)[c]
Adjusted R^2	-0.011	0.000	-0.005	-0.006	0.015	0.006	-0.004	0.006
Number of companies	246	246	246	246	246	246	246	246

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05 and 0.10 levels, using a two-tailed test.

The *t*-statistics given in brackets were adjusted for heteroscedasticity (White's correction).

$Perf._{-1to0}$ and $PerfAj._{-1to0}$ refer to performance change from year -1 to year 0 before and after adjusting for the matching companies respectively, and so forth.

FAMILYR, ALPHA and UNDPRC refer to family relationships, retained ownership and underpricing, respectively.

9.12 Summary

This chapter reports the empirical results on the accounting performance of 254 Malaysian IPOs that went public during the period 1990 to 2000. Comparison of the pre- and post-IPO accounting-based operating performance in terms of levels and changes provides some interesting findings. Summarising the main findings of this chapter, there is moderate evidence supporting the view that the average IPO in Malaysia underperforms seasoned companies over a three-year period. However, there is strong evidence of declining performance in the IPO year and up to three years following IPOs, relative to the pre-IPO period. The year-to-year analysis reveals that the decline in performance is greatest in the year immediately following the IPO. The deterioration in performance is more pronounced when performance is measured using accrual-based approaches. This finding is consistent with the results of prior studies documenting the long run underperformance of IPOs. The difference in the results between accrual- and cash flow-based measures suggests the possibility of earnings manipulation by IPO managers that increase their reported earnings at the time of going public.

IPO companies are also found to have post-IPO high growth in sales and capital expenditure. The decline in operating performance does not appear to be caused by a reduction in sales or cutting back of capital expenditure. The reduced efficiency in asset usage (lower asset turnover) does impact on operating performance. The results of this study, based on different market expectation indicators, consistently reveal a decline in accounting performance following IPOs. These indicate that investors have high expectations of future earnings growth based on performance observed prior to the IPOs. However, this expectation is not fulfilled. It is also found that Malaysian IPO

companies reduce their borrowings at the time of an IPO, and also in the first and second years after going public, but these increase subsequently.

While an IPO company's total assets, its equity and the number of shares will suddenly increase immediately after listing, it may take a while for cash flow, profits or earnings to grow. Therefore, accounting performance measured by ratios such as OCF/OA, OI/OA, ROE, or EPS are expected to drop immediately after listing. However, the consequences of this dilution should mainly influence the performance in the year of the IPO (year 0). The general results of this study demonstrate a decreasing trend, starting from the IPO year and lasting until three years post IPO. This indicates that the decline in accounting performance is not only an effect of the financing of the IPO itself, but reflects a genuine post-IPO deterioration in accounting performance.

Univariate analysis of IPOs involving family relationships shows slightly greater post-IPO deterioration in performance than IPOs with no family involvement. However, there is little evidence of family involvement significantly affecting post-IPO performance. With regard to the high and low ownership groups, this study does not support the signalling theory of ownership by Leland and Pyle (1977) and Downes and Heinkel (1982). Univariate analysis of IPOs with high and low underpricing revealed that there is a tendency for the high underpricing group to show inferior accrual-based operating performance in the long run. However, an opposite pattern is seen in the cash flow-based performance measure, which therefore provides some support for the signalling model of underpricing.

Overall, the results of the present study demonstrate that operating performance (cash flow-based and accrual-based), asset turnover and market expectations decline after

listing. While sales gradually increase, capital expenditure increases but then declines slightly, while the leverage ratio decreases and then increases slowly after IPOs. Univariate analysis of the association between family relationships, retained ownership, and post-IPO operating performance produces little evidence to explain the deterioration in operating performance. However, underpricing partially explains the deterioration in operating performance when the cash flow-based performance measure is used.

The following chapter provides a review of the empirical evidence on earnings management.

Chapter 10

Review of empirical studies and research hypotheses: Earnings management and IPO performance

10.1 Introduction

The main objective of financial reporting is to provide valuable information to investors, creditors and others for making operating, investing or financing decisions. The Generally Accepted Accounting Principles (GAAP)[98] allow managers flexibility in using their judgement to report financial information in the best possible light. However, managers may possibly exploit the GAAP's flexibility to manipulate accounting numbers, a process commonly known as earnings management.[99]

The results observed in Chapter 9 demonstrate that the accounting-based operating performance of Malaysian companies deteriorates following IPOs and is more pronounced when the accrual-based performance measure is used. This indicates that there is a likelihood that Malaysian IPO companies managed their earnings at the time of their IPOs to 'window-dress' their financial reports. As noted by Teoh *et al.* (1998a), managers can report unusually high earnings in excess of actual cash flows by adopting discretionary accounting accruals adjustments. In order to investigate in depth the potential of earnings manipulation, a review of the earnings management literature is

[98] The GAAP, established by the Financial Accounting Standards Board, are a widely accepted set of rules, conventions, standards, and procedures for managers in the process of reporting financial information.

[99] DuCharme *et al.* (2001) state that there are three broad classes of earnings management techniques available to managers, namely choice of accounting methods, revision of estimates, and accrual management.

provided in the first section of the present chapter. The review covers the general development of the earnings management tests through accrual choices, prior general earnings management studies, and prior earnings management studies of IPO and SEO performances. This gives a direction to Part 3 of this thesis which then follows the research questions and the hypotheses to be tested in the present study. The final section summarises the present chapter.

10.2 Review of empirical studies on earnings management

Schipper (1989), in her commentary paper on earnings management, defines earnings management as a *'purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain'* (p. 92).[100] Prior to an IPO announcement, managers may engage in earnings management due to the information asymmetry between the issuer and outside investors pertaining to the value of IPOs, as highlighted in Chapter 3. In general, earnings management is accomplished when income is shifted from future periods to the present or vice versa. In this situation, companies are said to borrow future income for the sake of managing earnings in the IPO year. This leads to increases in earnings during the IPO year and decreases thereafter. Specifically, managers can accelerate revenue recognition and defer expense recognition without violating current accounting rules. Teoh *et al.* (1998) state that high reported earnings raise stock prices, which is desirable when a company is selling equity. DuCharme *et al.* (2004) note that the negative relationship between earnings management and post-IPO performance raises serious questions pertaining to market

[100] Earnings management is also referred to by her as disclosure management.

efficiency with respect to widely available accounting information. Teoh *et al.* (1998a) argue that if the stock market were fully efficient, on average post-IPO stock price underperformance would not be observed.

Healy and Wahlen (1999) separate the motivations to manage earnings into three main areas: (i) the capital market; (ii) contracting; and (iii) regulatory. One motivation for earnings management in the area of the capital market is to increase the offer price of the shares sold and companies' value by increasing earnings. This will increase the worth of the shares retained by the owners, who will receive more cash in a secondary share issue at the expense of new investors. Marquardt and Wiedman (2004a) conduct a study on a sample of companies selling shares in secondary offerings[101] and find evidence that companies in which management[102] sell their own shares have higher discretionary accruals on average than companies where management does not sell.

Managers may also attempt to increase reported earnings prior to the IPO to gain an investor's confidence. By managing earnings, the IPO companies can make themselves look better than they really are. In the situation of high reported earnings prior to the IPOs, investors might expect that good performance would be sustained in the future. However, studies (e.g., Teoh *et al.*, 1998a, 1998b; DuCharme, Malatesta and Sefcik, 2001; among others) indicate that reported earnings that are managed upwards prior to stock offerings are related to poor stock market and operating performance. DuCharme *et al.* (2001) argue that at least three types of costs are associated with the manipulation

[101] The proceeds from a secondary offering go directly to the owners of the shares rather than to the offering company as in a primary offering. Therefore, the company's capital structure does not change.

[102] They define management as executive and directors.

of reported earnings, namely litigation costs, diminution of personal and corporate reputations, and loss of future accounting flexibility.

10.2.1 General development of earnings management tests through accrual choices

The earnings management instruments used for manipulating reported numbers consist of (i) real operating decisions (e.g., asset sales and change in R&D expenditure); and (ii) pure financial reporting decisions (e.g., changes in accounting method such as changing from accelerated to straight-line depreciation, and accrual choices). According to Young (1999), accrual choices are widely employed because they are a relatively low cost mechanism by which managers can affect reported numbers, and are by nature relatively opaque. Examples of accrual management include the decision to write down assets, to recognise or defer revenues, and to capitalise or expense certain costs such as repair expenditures (DeAngelo, 1986); recognition or deferral of revenues is an example of current accruals management.

Total accruals, which consist of discretionary accruals and nondiscretionary accruals, are normally used to measure earnings management. McNichols (2000) refers to this approach as the aggregate accruals approach. In order to decompose total accruals into a discretionary and a nondiscretionary component, a particular model is used. Discretionary accruals have to be estimated from total accruals because the degree of accruals management is not directly observable (Teoh *et al.*, 1998a). Furthermore, earnings management is difficult to identify without knowing management's true intentions (Wiedman, 2002). It is assumed that discretionary accruals are to be at the discretion of management (Perry and Williams, 1994; Teoh *et al.*, 1998a). For example,

if the allowance of doubtful accounts were changed because of management's self interest, the change in accruals would be discretionary. In contrast, a nondiscretionary accrual is an accrual component that naturally arises from the company's economic activities. Guay, Kothari and Watts (1996) specify three managerial discretion hypotheses, namely (i) the performance measure hypothesis; (ii) the opportunistic accrual management hypothesis; and (iii) the noise hypothesis. First, under the performance measure hypothesis, discretionary accruals help managers to produce a reliable and more timely measure of firm performance than using nondiscretionary accruals alone. Second, the opportunistic accrual management hypothesis is that discretionary accruals are used to hide poor performance or postpone a portion of unusually good current earnings to future years. Finally, the noise hypothesis is that the discretionary accruals introduce noise in reported earnings (Guay *et al.*, 1996, p. 83).

Several alternative models of expected accruals have been employed in previous studies to detect earnings management or abnormal accruals. The first, known as the Healy (1985) model, uses the *level* of total accruals to measure earnings management and requires the assumption that nondiscretionary accruals are stable over time. By contrast, the DeAngelo (1986) model, focuses on the *changes* in total accruals. In this model, the nondiscretionary component of accruals is assumed to follow a random walk, so the change in total accruals between the benchmark and test periods is assumed to be discretionary. Friedlan (1994) argues that this random walk assumption is not valid for IPOs because these companies tend to be growing and this may affect certain aspects of companies' operations, including their accruals.

Researchers have typically employed a regression-based model, such as the Jones (1991) model or the Modified Jones (1991) model (as suggested by Dechow, Sloan and

Sweeney, 1995), to derive abnormal accruals. As argued by Perry and Williams (1994), these models incorporate the economic activities of the companies during the test period, which may provide improved benchmarks over the earlier random walk model.

The regression-based models discussed above use time-series estimation procedures, which require a sufficiently long time-series of data to allow estimation of the regression parameters (Peasnell, Pope and Young, 2000). According to Young (1999), this may introduce survivorship bias. In addition, it assumes the nondiscretionary accruals' coefficient estimates are stationary or stable through time. In a related study, Peasnell *et al.* (2000) examine specification and power issues relating to the Jones (1991) and Modified Jones models that are used to estimate accruals cross-sectionally, which was initiated by DeFond and Jiambalvo (1994) instead of the time-series procedure. Under the cross-sectional approach, an industry specific portfolio is constructed for each sample company. It would appear that even though the cross-sectional approach may mitigate the survivorship bias, the bias in the estimation of the discretionary accruals may still be exist if all the companies in the industry estimation portfolio are managing earnings (Iqbal, 2002). Peasnell *et al.* (2000) also develop and test an alternative procedure, labelled the 'margin model'. It differs from existing procedures in that the drivers of normal accruals are derived from a formal model linking sales, accruals and earnings. They find that each of the three cross-sectional models is well specified when applied to a random sample of company-years and has the capability to generate relatively powerful tests for earnings management. They suggest that the cross-sectional accrual models may be more powerful than the time-series estimation procedures. In particular, they find that the Jones (1991) and Modified Jones models are more powerful for revenue and bad debt

manipulations, while the margin model appears to be more powerful at detecting non-bad debt expense manipulations.

In a more recent study, Kothari, Leona and Wasley (2005) introduce performance-matched discretionary accrual measures, in which the discretionary accruals from the Jones or Modified Jones models are adjusted for the corresponding discretionary accruals of a company matched on prior year return on assets (ROA) and industry. Even though their results suggest that performance matching is critical to designing well-specified tests of earnings management, they caution that their measure cannot and does not solve all the problems arising from bad discretionary accrual models. Also, the difficulty in finding a good match, based on industry and performance in some markets, casts doubts on the general applicability of this approach. Table 10.1 describes several proxies used to test for earnings management as adopted in the aggregate model approach and lists the authors using these proxies.

Table 10.1 Several discretionary accrual proxies under the aggregate accruals models

Authors	Discretionary accrual proxy
Healy (1985)	Total accruals
DeAngelo (1986)	Change in total accruals
Jones (1991)	Residual from a regression of total accruals on change in sales and property, plant and equipment
Dechow *et al.*(1995)	Residual from a regression of total accruals on change in sales and on property, plant and equipment, where revenue is adjusted for change in receivables in the event period (known as Modified Jones model)
Kothari *et al.* (2005)	Discretionary accruals from the Jones model or Modified Jones model are adjusted for the corresponding discretionary accruals of a performance-matched company on prior year return on assets (ROA) and industry

Source: Papers published by the authors.

Several researchers have also examined a number of specific accruals in order to test for earnings management. These include provision for bad debts (McNichols and Wilson, 1988), bad debt expense (Teoh *et al.*, 1998), claim loss reserves (Beaver, McNichols and Nelson, 2003), tax expense (Dhaliwal, Gleason and Mills, 2004), and individual accruals[103] (Marquardt and Wiedman, 2004b). Another approach identified by McNichols (2000) is the frequency distribution approach. One of the tests for earnings management under this approach is to determine whether the frequency of annual earnings realisations in the region above (below) zero earnings and last year's earnings is greater (less) than expected (e.g., Burgstahler and Dichev, 1997).

McNichols (2000) finds that the greatest number of studies uses an aggregate accruals approach based on the Jones model. These studies suggest that it is widely accepted as a proper proxy for earnings management. In the absence of strong evidence regarding the superiority of alternative models, the cross-sectional Modified Jones model appears to be the benchmark model for use in detecting earnings management.

10.2.2 Prior general earnings management studies

A concise review of the state of knowledge in the area of earnings management is given by Healy and Wahlen (1999). Prior studies have investigated various incentives to manage accruals in a variety of settings; these are illustrated in Table 10.2.

[103] The individual accruals are account receivable, inventory, accounts payable, accrued liabilities, depreciation expense, and special items.

Healy (1985) examines the effect of bonus schemes[104] on managerial accounting decisions. He postulates that executives remunerated by using a bonus plan based on accounting earnings, select accounting procedures that increase their compensation. He finds that accrual policies of managers are related to income reporting incentives of their bonus contracts. This evidence suggests that managers are more likely to report a decrease in earnings to increase future compensation. He also finds that changes in accounting procedures by managers are associated with adoption or modification of their bonus plan.

Table 10.2 Several published earnings management studies in different contexts

Setting	Author(s), Year of publication
Management compensation	Healy (1985)
Management buyout	DeAngelo (1986), Perry and Williams (1994))
Union negotiations	Liberty and Zimmerman (1986)
Companies with extreme income	McNichols and Wilson (1988)
Bank regulations	Moyer (1990)
Import relief	Jones (1991)
Initial public offerings	Aharony, Lin and Loeb (1993), Friedlan (1994), Teoh *et al.* (1998a), Teoh *et al.* (1998), DuCharme *et al.* (2001, 2004)
Debt covenants constraint	DeFond and Jiambalvo (1994)
Stock mergers	Erickson and Wang (1999), Louis (2004)
Seasoned equity offerings	Rangan (1998), Teoh *et al.* (1998b), Shivakumar (2000), Kim and Park (2005)
Price control regulations	Bowman and Navissi (2003)

[104] Bonus schemes award managers if annual earnings' targets (e.g., in terms of earnings per share, return on total assets, or return on equity) are attained.

Several studies examine earnings management prior to management buyouts and have provided mixed results. DeAngelo (1986) investigates the accounting decisions made by managers of 26 New York Stock Exchange[105] listed companies and 38 American Stock Exchange[106] listed companies, using various combinations of prior years' accruals as benchmarks. These companies proposed to purchase all publicly-held common stock and 'go private'[107] during the period 1973 to 1982. DeAngelo (1986) hypothesises that managers understate earnings in order to lower the buyout compensation by paying outsiders less than the fair value for their shares. However, her results reveal no indication that managers systematically understate earnings in the periods prior to buyout. Perry and Williams (1994) undertake a similar study with a sample of 175 management buyouts during the period 1981 to 1988, but using the Jones (1991) model instead of the change in total accruals. They provide convincing evidence of manipulation of discretionary accruals in the predicted direction in the year preceding the public announcement of management's intention to bid for control of the company. Their results indicate that abnormal accruals are negative prior to management buyouts. The authors suggest that the principal difference in results obtained from the DeAngelo's (1986) study is due to the small sample used in DeAngelo's study, not the methods.

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[105] New York Stock Exchange (NYSE) is the oldest and largest stock exchange in the US (http://www.netxclient.com/universal2/invest_glosry_NNe.htm#NewYorkStockExchange, as at 18 Jan 2005).

[106] American Stock Exchange (AMEX) is the second largest stock exchange in the US. As a general rule, the securities traded on the AMEX are those of small to mid-size corporations. The AMEX also trades options of many NYSE securities and some OTC securities (http://www.netxclient.com/universal2/invest_glosry_AdAm.htm, as at 18 Jan 2005).

[107] Going private is known as a management buyout transaction through which managers become the sole owners of a public corporation by purchasing all of the common stock held by outsiders. A management buyout in which the subsequent private company is highly leveraged is known as a leveraged buyout (DeAngelo, 1986, p. 401, and note 1).

Liberty and Zimmerman (1986) examine the hypothesis that managers reduce reported earnings during union contract negotiations. They analyse earnings released before and after contracts are negotiated for a sample of 105 unionised companies over the period from 1968 to 1981. However, they find no evidence of lower than expected earnings during labour contract negotiations. They suggest that managers in the unionised companies had little incentive to reduce reported earnings because they were already performing poorly.

McNichols and Wilson (1988) examine whether managers manipulate earnings when income is unusually high or low[108] for 138 companies from 1967 to 1985. Their study models a specific type of accruals (the provision for bad debts), rather than a collection of accruals. As with aggregate accruals studies, they model provision for bad debts to identify its discretionary and nondiscretionary components. They use the residual from a regression of specific accruals (provision of bad debts as a function of the beginning balance in the allowance for bad debts, write-offs during the year, and write-offs in the year after) to proxy for managerial accounting discretion.[109] They hypothesise that companies with unusually high income will take income-decreasing[110] actions. Consistent with their hypothesis, they find evidence that managers manage earnings by choosing income-decreasing accruals, when income is high.

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[108] This refers to companies with extreme earnings that are above or below target in which the observations are ranked based on deviations from the benchmark. Companies in the top (bottom) deciles are considered as companies with unusually high (low) earnings.

[109] According to McNichols and Wilson (1988), management can exercise discretion through three ways: (i) accounting method choice; (ii) operating, investing, and financing policies; and (iii) choice of estimates for a given accounting method (p. 2, note 3).

[110] Discretionary (managed) accruals are on average zero. Large positive discretionary accruals are taken as evidence of income-increasing earnings management. In contrast, large negative discretionary accruals are taken as evidence of income-decreasing earnings management (Wiedman, 2002).

Moyer (1990) examines the incentives of a commercial bank manager to reduce regulatory costs that are imposed when the bank's capital adequacy ratio falls below its regulatory minimum. This is due to the fact that banks with inadequate capital are likely to incur greater regulatory costs than banks with adequate capital. She finds that some managers adjust accounting measures to reduce regulatory costs imposed by bank regulators. Her results are generally consistent with the hypothesis that managers adopt ratio-increasing accounting adjustments as the primary capital adequacy ratio declines relative to its regulatory minimum.

It appears that companies also manage earnings to obtain import relief[111] (i.e. import protection). Jones (1991) studies import relief investigation by the United States International Trade Commission (ITC) in order to provide evidence on a specific motive for earnings management. She tests whether companies that would benefit from import relief attempt to decrease earnings through earnings management. The profitability of the industry is one of the factors to increase the likelihood of obtaining import relief and/or increase the amount of relief granted. Her results support the earnings management hypothesis, suggesting that managers decrease earnings through earnings management during the year of import relief investigations.

DeFond and Jiambalvo (1994) examine the abnormal accruals of a sample of 94 companies that reported debt covenant violations in annual reports from 1985 to 1988. They find that abnormal accruals are significantly positive in the year prior to violation,

[111] Jones (1991) provides two examples of import relief, namely tariff increases and quota reductions.

to loosen the companies' debt constraints. Their results indicate that debt agreements motivate managers to manipulate earnings.

Erickson and Wang (1999) examine earnings management around stock for stock mergers, using a sample of 55 mergers and show that acquiring companies overstate earnings in the pre-merger quarters. Their explanation for this is that target companies anticipate the mergers. These companies adjust for anticipated earnings management when negotiating the purchase price. Therefore, both the number of shares they must use in the exchange and the cost of buying the target companies will be reduced. Using a large sample of 373 mergers (236 pure stock swaps and 137 pure cash purchases), Louis (2004) examines earnings management around and after merger announcements. In line with Erickson and Wang (1999), Louis (2004) finds strong evidence suggesting that acquiring companies overstate their earnings reports in the quarter preceding a stock swap announcement, whereas it is statistically insignificant for acquirers that pay with cash.

In order to test the construct validity of the earnings management model, Bowman and Navissi (2003) investigate the relationship between abnormal returns and earnings management in the context of price control regulations in New Zealand. They find that price control regulations affect companies' security prices negatively. Their results also reveal that companies make income-decreasing discretionary accruals. This will increase the probability of approval for a company's price increase application, based on financial hardship criteria. The results from their further analysis suggest that companies that are affected more negatively by price regulations are more aggressive in managing earnings.

In sum, various incentives to manage earnings have been reported in general earnings management studies. The evidence is confined not only to companies that make equity offerings. The results show that managers make income-increasing or decreasing in different settings by way of managing earnings. However, several studies examining discretionary accruals of the same settings find inconsistent findings of earnings management (e.g., DeAngelo, 1986 and Perry and Williams, 1994). Young (1999) highlights that, one possible explanation is the measurement error induced by alternative approaches to the estimation of discretionary accruals. It can be said that the estimation approach employed to detect earnings management remains an open empirical question. The difficulty in modelling and measuring discretionary and nondiscretionary accruals may cause the different results observed in earnings management studies.

A review of the earnings management studies on IPOs and SEOs is provided in the following section.

10.2.3 Prior earnings management studies on equity offerings

10.2.3.1 Initial public offerings (IPOs)

There are relatively few published articles about earnings management by IPO companies and these are all based on US data, with one exception based on the Netherlands and one working paper on Malaysia; Table 10.3 summarises these studies.

Earlier studies (e.g., Aharony *et al.*, 1993; Friedlan, 1994; and Neill, Porciau and Schaefer, 1995) focus only on earnings management behaviour prior to IPOs. Aharony *et al.* (1993) investigate whether IPO issuers make income-increasing discretionary accruals prior to going public. They find that the practice of increasing reported net income is not pervasive. Their findings further indicate that earnings management, on average, is more pronounced for smaller companies and for those with large financial leverage. However, they find only weak evidence that earnings management is related to the reputation of the underwriter and the quality of the auditors employed by companies prior to an IPO. They explain the weakness of their results may be due to their sample selection method which may be biased towards selecting larger and less risky (lower leverage) IPO companies.

On the other hand, Friedlan (1994) who also addresses the issue of the accounting choices of IPO companies, finds evidence that IPO issuers make income-increasing discretionary accruals in the financial statements released in the prospectus before the IPOs. His results also indicate that IPO issuers manage their earnings to influence the

Table 10.3 A summary of studies testing for earnings management around IPOs

Study, Sample, Period of study and Country examined	Methodology used to test for earnings management	Results
Aharony *et al.* (1993) 229 IPOs 1985-1987 US	Healy's (1985) model and DeAngelo's (1986) model	No evidence for high abnormal pre-IPO accruals. More pronounced for small companies with higher level of debts.
Friedlan (1994) 155 IPOs 1981-1984 US	Modified DeAngelo (1986) model	IPO issuers use discretionary accrual to increase earnings prior to going public.
Neill *et al.* (1995) 505 IPOs 1975-1984 US	No model used but examined directly accounting method choices (depreciation method and inventory cost flow assumptions)	IPO issuers use accounting choices to enhance reported income prior to the IPOs.
Teoh *et al.* (1998a) 1,649 IPOs 1980-1992 US	Modified Jones (1991) model	Discretionary current accruals are high around the IPO relative to those of nonissuers. Issuers with higher discretionary accruals have poorer stock return in the subsequent three years.
Teoh *et al.* (1998) 1,682 IPOs 1980-1990 US	Modified Jones (1991) model Matched-Pair Proxy Beneish M-Score	IPO companies, on average, have high positive issue-year abnormal accruals and earnings followed by poor long run earnings and negative abnormal returns.
DuCharme *et al.* (2001) 171 IPOs 1982-1987 US	Jones (1991) model Modified Jones (1991) model Cash Flow model	Aggressive earnings management prior to IPOs increases initial firm value, but decreases subsequent returns to investors.

continued on next page

Table 10.3 (*continued*) A summary of studies testing for earnings management around IPOs

Study, Sample, Period of study and Country examined	Methodology used to test for earnings management	Results
Abdul Rahman and Wan Abdullah (2003) 187 IPOs 1989-1998 Malaysia	Modified Jones model	A significant positive DCA prior to IPOs. No significant relationship between prior earnings and negative share return performance three years after the IPOs.
Roosenboom *et al.* (2003) 64 IPOs 1984-1994 Netherlands	Modified Jones (1991) model DeAngelo (1986) model	Discretionary current accrual is higher in the first year as a public company but not in the years before the IPOs. Issuers with higher discretionary accruals have poorer stock return in the subsequent three years.
DuCharme *et al.* (2004) 5,324 IPOs 1988-1997 US	Modified Jones (1991) model	Inverse relationship between abnormal accruals and post offer stock returns.

effect of accounting-based contracts[112] on wealth distribution[113]. Neill *et al.* (1995) complement the work undertaken by Aharony *et al.* (1993) and Friedlan (1994) by examining directly the accounting method choices of IPOs instead of estimating unexpected accruals. The accounting method choices considered are the depreciationmethod and the inventory cost flow assumption.[114] They also found evidence that IPO issuers use accounting choices to enhance reported income prior to the IPOs.

Empirical studies that focus on the relationship between earnings management and IPO performance began to appear in the late 1990s (e.g., Teoh *et al.*, 1998a; Teoh *et al.*, 1998; DuCharme *et al.*, 2001, 2004; Roosenboom *et al.*, 2003). Teoh *et al.* (1998a) examine whether issuers of initial public offerings increase accruals and thereby report earnings in excess of cash flows prior to IPOs. They also examine whether discretionary accruals predict the cross-sectional variation in post-IPO long run stock return performance. Their sample of 1,649 IPO companies is sorted by their asset-scaled discretionary accruals into quartiles. IPO companies with the lowest discretionary current accruals are labelled as 'conservative' IPOs while the quartile of IPOs with the highest discretionary current accruals is labelled as 'aggressive' ones.

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[112] Some examples of accounting-based contracts are bonus schemes (Healy, 1985; Gaver, Gaver and Austin, 1995), and capital adequacy ratio regulations (Moyer, 1990).

[113] The offering price has a significant effect on the wealth of the IPO issuers. This is because a higher offering price will increase the offering proceeds. DuCharme *et al.* (2001) state that there are two ways a higher offering price benefits issuers: i) shares retained by the entrepreneur are worth more; and ii) more cash is received for the secondary shares sold, in which the proceeds go directly to the owners (p. 370, note 1).

[114] They classify a company using both accelerated depreciation and LIFO as a 'conservative' method company (making income-decreasing accounting choice), one using neither accelerated depreciation nor LIFO as a 'liberal' method company (making income-increasing accounting choice), and all other companies as 'mixed' method companies.

They find evidence that issuers with unusually high accruals in the IPO year experience poor stock return performance in the three years thereafter, which supports the opportunistic earnings management hypothesis. They find that 'aggressive' quartile IPOs earn a cumulative abnormal return of approximately 20 to 30% less than the cumulative abnormal return of 'conservative' IPOs. Moreover, they argue that investors may be misled by high earnings numbers reported at the time of IPOs, and then put too high a price on the new issues.

A similar study by Teoh *et al.* (1998) investigates the magnitude of accruals in the IPO year and several years after. In the IPO-year, they find that IPO companies, on average, have high positive earnings performance[115] and abnormal accruals. However, they find that earnings performance and stock returns performance are poor in the long run. They report that the post-IPO earnings performance is significantly below the industry average, predicted by high abnormal current accruals during the IPO year. In line with Teoh *et al.* (1998a), they find that abnormal accruals in the IPO year predict greater post-issue stock return underperformance. DuCharme *et al.* (2001), who investigate the earnings management of 171 companies prior to making IPOs during the period 1982 to 1987, also find a significant relationship between abnormal accruals and post-IPO stock returns. However, they do not find a significant negative relationship between abnormal accruals and post-IPO accounting performance. Soffer (2001) comments that the mixed results observed by DuCharme *et al.* (2001) are a little bit confusing and he suggests that their results may not be due to earnings management.

[115] Three alternative measures of post-issue earnings performance are examined, which are the return on sales, the industry-adjusted return on sales and matched-company relative returns on sales.

The first earnings management study of European IPOs was undertaken by Roosenboom *et al.* (2003), who examine the pattern of discretionary current accruals (DCA) using a sample of 64 Dutch IPOs. They find that managers manage their company's earnings in the first year as a public company but not in the years before the IPO. Their result is consistent with earlier findings of Teoh *et al.* (1998a) who also report that IPO companies in the US make income-increasing accruals in the first year as a public company, and Aharony *et al.* (1993) who find little evidence of earnings management of US IPOs in the years before going public. They also investigate the impact of earnings management on the long run stock price performance and find a negative relationship between the size of the DCA in the IPO year and long run stock price performance over the next three years. Their results indicate that IPO managers who over-report earnings in the IPO year subsequently suffer poor returns.

Recently, DuCharme *et al.* (2004) have further studied the relation among earnings management, stock offers, post-offer stock returns and related shareholders lawsuits of 5,324 IPOs and 4,908 SEOs from 1988 through 1997. They find that abnormal accounting accrual measures of earnings management are unusually high around stock offers and tend to reverse subsequently, and are inversely related to post-offer stock returns. They report that abnormal accounting accruals are especially high for companies whose offers subsequently attract lawsuits. Sued companies are found to have much lower stock returns as compared to non-sued counterparts. They suggest that some companies opportunistically manipulate earnings upwards before stock issues, thereby exposing themselves to litigation.

The only study on the earnings management of Malaysian IPOs is the working paper by Abdul Rahman and Wan Abdullah (2003), using a sample of 187 IPOs over the period

1989 to 1998. They find significant positive discretionary current accruals (DCA) prior to IPOs. However, they find no evidence to suggest that the pre-IPO DCA is able to predict the post-IPO negative abnormal returns.[116] They suggest that the significant share price underperformance in the post-IPO period may be due to unfavourable earnings information revealed by media, analysts' reports and subsequent financial statements after the IPOs. However, they do not investigate the relationship between earnings management and post-IPO accounting-based operating performance.

10.2.3.2 Seasoned equity offerings (SEOs)

Rangan (1998), Teoh, Welch and Wong (1998b), and Shivakumar (2000), examine the role of earnings management on US SEOs. Using a sample of 230 SEOs in the years from 1987 to 1990, Rangan (1998) investigates whether earnings management surrounding the offerings can explain a portion of the poor stock price and earnings performance. His results indicate that earnings management in the period surrounding the offering predicts both the changes in earnings and market-adjusted stock returns in the year following the offering year. These results suggest that the issuing companies are temporarily overvalued by the stock market, which is then disappointed by predictable declines in earnings caused by earnings management. Teoh *et al.* (1998b) also hypothesise that investors fail to recognise earnings management at the time of SEOs. They argue that investors naively extrapolate the increase in the pre-offering earnings, and consequently overvalue the new issues. They report that discretionary current accruals grow before the offering, peak in the offering year, and decline

[116] They examine the first, second, and third year stock price performance relative to 'control' companies matched by industry and size (total assets).

thereafter. This accruals pattern causes net income to follow a similar trend. Moreover, they find a negative relationship between pre-issue discretionary current accruals and post-issue earnings and stock returns.

On the other hand, the work carried out by Shivakumar (2000) proposes a non-opportunistic motive for earnings management. He tests whether companies do mislead investors by overstating earnings before SEOs. He finds evidence of earnings management around equity offerings, which is consistent with Rangan (1998), and Teoh *et al.* (1998b). However, in contrast to their conclusions, he shows that investors infer earnings management and unravel its effects at the time of equity offering announcements, as the pre-announcements abnormal accruals predict the two-day negative price reaction observed. He argues that the earnings management of the SEOs' issuers may not be designed to mislead investors. Conversely, it may merely reflect the issuers' rational response to anticipated market behaviour at the announcement date. His results support the managerial response hypothesis, in which investors expect companies announcing equity offerings to manage earnings and, consistent with this expectation, issuers overstate earnings before announcing their offerings. He also comments that the negative relationship between pre-offering accruals and post-offering returns found by Teoh *et al.* (1998a) and Rangan (1998) appear to be due to test misspecification, such as skewness in long horizon returns data.

In a related study but using UK data, a working paper by Iqbal, Espenlaub and Strong (2004) investigates the long run operating and stock price performance of 181 UK open offers made during the period 1991 to 1995 in the context of the earnings management hypothesis, which predicts both pre-issue improvements and post-issue declines in operating and stock price performance of SEO companies. They find that an aggressive

earnings management pre-offer leads to worse operating and return performance post-offer. Consistent with the US findings, their regression results exhibit a significant negative relation between pre-offer DCA and two-*year* post-offer returns, but no relation between pre-offer DCA and two-*day* offer announcement returns. They suggest that their results are more consistent with the earnings management hypothesis as in Teoh *et al.* (1998b) and Rangan (1998) studies but do not support the managerial response hypothesis observed by Shivakumar (2000). They argue that the significant negative relationships between pre-offer DCA and post-offer returns is due to investors not taking full account of the information available before the offer.

In summary, most of the IPO and SEO studies estimate the extent of earnings management around the time of equity offerings and suggest that earnings are managed prior to, or at the time of, IPOs and SEOs. Several studies relate the earnings management at the time of IPOs and SEOs with post-issue stock market and earnings performance. Although different models for estimating earnings management are employed, the evidence is generally consistent across the studies, suggesting that earnings management at the time of equity offerings is negatively correlated with subsequent stock market and earnings performance. However, in the IPO setting, only the study undertaken by Teoh *et al.* (1998) relates the earnings management and post-IPO accounting-based operating performance but investigate solely the change in return on sales for years +1 to +3 relative to IPO year.

It would appear that no published research to date has examined the earnings management issue for Malaysian IPOs. In fact, earnings management studies on Malaysian companies in general are sparse. A working paper by Abdul Rahman and Wan Abdullah (2003) is the only study examining the Malaysian IPO market. Another

study by Wan-Hussin and Ripain (2003) examines the income smoothing behaviour on a sample of 92 IPO companies with profit guarantees during to the period 1996 to 1999. However, income smoothing is not the subject of the present thesis. Abdul Rahman and Wan Abdullah's (2003) paper has examined earnings management only prior to IPOs and its relationship with the post-IPO share returns for a sample period up to 1998. The level of earnings management over time are not investigated by them, nor is the relationship with the post-IPO operating performance considered. Moreover, they estimated the expected accruals for IPO companies using data of 'control companies'. The methods employed by them are somewhat ambiguous as to whether the 'control companies' defined by them are the industry-wide peers or a size-matched sample. In addition, they have employed only a simple calculation of long run holding period returns that ignores the effect of compounding, in which only capital gains based on the stock price on first trading day, and the stock price on the first, second and third year are computed. Given that there is no published study on the earnings management from the IPO year and up to three years post-IPO, and its association with both stock market and operating performance using more recent data, therefore a more comprehensive study is needed.

10.3 Research questions

As reviewed in Section 10.2, prior evidence revealed that the subsequent poor stock market performance and accompanying operating performance may be due to earnings that are managed upwards at the time of IPOs. The accounting discretion allowed by GAAP may provide IPO managers with both incentives and opportunities to manage earnings at the time of IPOs to increase the stock price, which in turn increases the offer proceeds to the company and existing shareholders (Roosenboom *et al.*, 2003). Teoh *et*

al. (1998) argue that if the IPO companies boost earnings at the time of IPOs, the initial financial statements of these companies will contain unusually high positive accruals. They suggest that earnings in the post-IPO period will decline since these accruals will not reflect favourable long run prospects for IPO companies and the high positive accruals will reverse in the post IPO period.

A review of both the earnings management and IPO literatures suggests the following general research questions:

1. *'Do Malaysian IPO companies manage earnings at the time of IPOs?'*

If so,

2. *'Does more aggressive IPO year earnings management lead to worse subsequent stock market and operating performance?'*

10.4 Formal hypotheses

The present study seeks to investigate whether earnings management at the time of IPOs may contribute to the poor operating performance observed in Chapter 9. Investigating the pattern of earnings management over time (the levels of accruals in the IPO year and post-IPO) may provide further explanation for the greater deterioration in the accrual-based operating performance measure than the cash-flow measure, as revealed in Chapter 9. Therefore, the main hypothesis of this study is that Malaysian IPO managers manage their reported earnings more at the time of IPOs than in the subsequent years. Given that the sample period of this study covers the East Asian crisis year 1997-1998, it is also hypothesised that companies may engage in more

earnings management during this unfavourable economic environment, due to the need to increase investors' confidence on new issues. It is also expected that companies that are involved in aggressive earnings management at the time of IPOs show more deterioration in subsequent stock market and operating performance. Hence the present study formulates the following four hypotheses:

H1: The level of earnings management of IPO companies is higher in the IPO year than in subsequent years.

H2: The level of IPO year earnings management is higher during the East Asian crisis years of 1997-1998 than the rest of sample period.

H3: The more aggressive earnings management at the IPO year leads to worse post stock market and operating performance.

H4: There is a difference in the level of post-IPO stock market and operating performance between IPO companies in the aggressive earnings management quartile (Q4) and conservative earnings management quartile (Q1).

10.5 Summary

This chapter has reviewed previous research on earnings management in general and during IPOs in particular. The empirical evidence discussed in Section 10.2, suggests that earnings management does occur in various contexts. The research question and formal hypotheses for the present study are also identified. The following chapter

explains the research design employed to investigate earnings management and its association with post-IPO performance.

Chapter 11

Research design to investigate earnings management and IPO performance

11.1 Introduction

Following the review of the literature in Chapter 10, the present chapter provides the research design used to investigate the likelihood of opportunistic earnings management by Malaysian companies at the time of IPOs. The remainder of this chapter is structured as follows: In the next section, the sample selection and data sources utilised in the present study are briefly discussed. This is followed by an explanation of the method used to measure the variables of interest, the earnings management model and the analysis to be undertaken. The final section summarises the present chapter.

11.2 Sample selection and data sources

The present study uses the same sample of companies and selection criteria as described in Chapter 8. It requires stock return data to be available on the Datastream database and uses the available data employed for the accounting-based operating performance study (Chapters 7 to 9). The accrual variables examined at the time of IPOs were obtained from the first public annual reports, which include the financial information of both pre-IPO and post-IPO years.[117] The first public annual reports rather than the

[117] Teoh *et al.* (1998) and Teoh *et al.* (1998a) also examined the IPO year accruals and used the first public annual reports to examine the earnings management of US IPOs.

pre-IPO financial statements are used due to the fact that two years of data are required to compute the earnings management proxy, and the lack of full pre-IPO data, as described in Chapter 8. Moreover, there is likelihood that earnings management incentives are likely to persist in the months immediately after the offerings (Teoh *et al.* 1998a). This is because the promoters of certain sectors of Main Board companies and all Second Board companies must hold at least 45% of the issued paid-up shares of the company for one year after the company's admission to the KLSE. Following Teoh *et al.*'s (1998a) argument, the promoters of these companies may support a high stock price after IPOs as they may wish to sell their personal holdings after the lock-in period. Another reason is that Malaysian IPO companies may still manage earnings a few months after IPOs to meet the mandatory earnings forecast disclosed in the offering prospectuses and maintain a high market price.

11.3 Methods

11.3.1 Measure of earnings management

The present study predicts that managers are most likely to manage earnings upwards at the time of IPOs in order to increase their offering proceeds and maintain a high market price after IPOs. It is generally assumed that earnings are managed in several ways, such as through discretion over accruals (e.g., Healy, 1985; Jones, 1991; Teoh *et al.*, 1998a), through timing of real investment or financing decisions (e.g., Hand, 1989), and through choices of accounting methods (e.g., Neill *et al.*, 1995). Following Teoh *et al*, (1998a), among others, the present study measures earnings management using discretionary accruals. As argued by DuCharme *et al.* (2001), *'accruals not only reflect*

the choice of accounting methods but also the effect of recognition timing for revenues and expenses, asset write-downs, and changes in accounting estimates' (p.376).

Earnings reported in the annual report consist of cash flows from operations and accounting adjustment called accruals.

$$Net\ income = Total\ accruals + Cash\ flow\ from\ operations \qquad (11.1)$$

Total accruals then can be expressed as:

$$Total\ accruals = Net\ income - Cash\ flow\ from\ operations \qquad (11.2)$$

Based on Teoh *et al.* (1998a), total accruals may be decomposed into two categories, with four components: time period (current and long term accruals) and managerial control (discretionary and nondiscretionary variables). In other words, the four components are: (i) discretionary current accruals (DCA); (ii) discretionary long term accruals (DLA); (iii) nondiscretionary current accruals (NDCA); and (iv) nondiscretionary long term accruals (NDLA).

Current accruals are adjustments made to short term assets and liabilities. One way to increase current accruals is by accelerating recognition of revenues (e.g., recognising profit on work in progress) but delaying the recognition of expenses (e.g., bad debt expenditure or stock valuation). Current accruals usually reverse in the following year. On the other hand, long term accruals adjustment involves long term assets and liabilities. They can be increased by decelerating depreciation, decreasing deferred taxes or realising unusual gains. Discretionary variables are 'managed' or 'abnormal (or unexpected)' components that are subject to management discretion to manipulate

earnings. Meanwhile, nondiscretionary variables are 'unmanaged' or 'normal (or expected)' components that are constrained by rules, institutions, and economic circumstances (Teoh *et al.*, 1998a; Roosenboom *et al.*, 2003). Since managers have more discretion over short term than over long term accruals, as argued by Teoh *et al.* (1998a,b), the present study employs discretionary current accruals (DCA)[118] to proxy for earnings management, as also used by Roosenboom *et al.* (2003) and DuCharme *et al.* (2001, 2004). In addition, another reason to focus on DCA is that the Malaysian industry-wide data to compute discretionary long term accruals (DLA) was not available from Datastream.

11.3.2 Earnings management model

In order to test for earnings management using accrual management approaches, the discretionary and nondiscretionary components of current accruals need to be distinguished. According to Wiedman (2002), the assumption behind separating these components is that changes in current accruals move proportionately with changes in sales. When changes in current accruals do not move proportionately with changes in sales relative to other companies in the same industry and year, then the unexpected or discretionary portion of current accruals is assumed to be the managed portion.

Current accruals are defined as the change in noncash current assets minus the change in operating current liabilities. Change is measured from year to year. Examples of noncash current assets are accounts receivables, inventory, and other current assets

[118] Discretionary current accruals also refer to current working capital accruals.

while operating current liabilities are accounts payable, tax payable, and other current liabilities. The definitions are:

$$Current\ accruals\ (CA) = \Delta(Current\ assets - Cash) - \Delta(Current\ liabilities - Current\ maturity\ of\ long\ term\ debt) \quad (11.3)$$

As the model used to estimate nondiscretionary accruals is subject to criticism and remains an empirical question, the present study employs the most frequently used model, as suggested by Dechow *et al.* (1995). The model is referred to as the Modified Jones model. As shown by Dechow *et al.* (1995), it is the most powerful model in detecting earnings management among several alternative models of earnings management. The use of this model is justified since the purpose of this study is to provide evidence only on the existence of opportunistic earnings management and not on the methodological issue per se. This model has been adopted by Teoh *et al.* (1998a) and Roosenboom *et al.* (2003), and is utilised to separate the total current accruals into expected (nondiscretionary) and abnormal (discretionary) components. It is a modified version of the model introduced by Jones (1991), the only difference being that the nondiscretionary accruals are estimated from the cross-sectional[119] Modified Jones model, in which only changes in sales need to be adjusted for changes in trade receivables, as in equation 11.5. This will mitigate the possibility of credit sales manipulation by the issuer resulting from managers timing the recognition of revenues

[119] As reviewed in Chapter 10, the time-series approach is infeasible for IPOs because it requires a sufficiently long time-series of data to allow estimation of the regression parameters (Peasnell *et al.*, 2000), which may introduce survivorship bias (Young, 1999). In addition, it assumes the nondiscretionary accruals coefficient estimates are stationary or stable through time (Young, 1999). On the other hand, the cross-sectional approach assumes the coefficients are the same for all companies within a particular year and industry (Kasznik, 1999).

(Dechow *et al.*, 1995). Using the accruals model as suggested by Dechow *et al.* (1995), the expected current accruals for each of the IPO sample companies in a given year are estimated using an estimation portfolio of all level 3 industry peers[120] available on the Datastream and PACAP databases using the following cross-sectional model:

$$\frac{CA_{j,t}}{TA_{j,t-1}} = \alpha_0\left(\frac{1}{TA_{j,t-1}}\right) + \alpha_1\left(\frac{\Delta Sales_{j,t}}{TA_{j,t-1}}\right) + \varepsilon_{j,t} \qquad j \in \textit{estimation portfolio} \qquad (11.4)$$

where:

CA = *Current accruals;*

j = *Companies are in the same level 3 Datastream industry subsector but excluding the issuer and companies involved in an IPO in the previous three years;*

$\Delta Sales_{j,t}$ = *change in sales for company j in the industry estimation portfolio in year t;*

$TA_{j,t-1}$ = *lagged total assets for company j in the industry estimation portfolio.*

$\varepsilon_{j,t}$ = *regression disturbances, assumed cross-sectionally uncorrelated and normally distributed with zero means.*

Similar to prior studies (e.g., Teoh *et al.*, 1998a; Roosenboom *et al.*, 2003; DuCharme *et al.*, 2004) all the variables are scaled by lagged total assets to reduce heteroscedasticity and to control for differences in company size. The change in sales is included to control for changes in nondiscretionary accruals caused by the change of economic conditions. A cross-sectional regression is performed separately in each fiscal year for each industry portfolio to estimate the coefficients α_0 and α_1, to control for changes in

[120] The IPO companies in that year and the previous three years are not included in the regression.

nondiscretionary accruals and to allow the nondiscretionary accruals to vary from period to period for different industries. Thus, the effect of changes in industry-wide economic circumstances in each specific year on current accruals can be controlled. In addition, the coefficients α_0 and α_1 are allowed to change across years to allow for possible structural changes, such as management changes (DeFond and Jiambalvo, 1994).

An estimation portfolio is assigned for each of the IPO companies in the sample in order to estimate the coefficients α_0 and α_1. The present study restricts the analysis to estimating industry portfolios that consist of 10 companies[121] or more in the same level 3 Datastream industrial classification of the IPO companies in the same fiscal year. IPO companies and companies that made an IPO in the previous three years are excluded from the industry portfolios. Due to the shortage of companies in certain industries, several similar industries are combined together. This results in six industry groups: (i) Basic; (ii) Consumer Goods (Cyclical and Non Cyclical); (iii) Services (Cyclical and Non Cyclical); (iv) General Industrials and Information Technology; (v) Resources and Utilities; and (vi) Real Estate Development.

Table 11.1 gives the number of companies in each estimation portfolio in each industry-year. The number of IPO companies related to each industry grouping is reported in brackets. There are 84 separate industry-year estimation portfolios observed during the period 1990 to 2003, which consist of 4,308 seasoned company-years. A

[121] Iqbal *et al.*(2004) restrict their observation to six or more to estimate the portfolio, while Peasnell *et al.* (2000), Teoh, *et al.* (1998), and DuCharme *et al.* (2001) restrict theirs to at least 10.

Table 11.1 Number of companies in each estimation portfolio in each industry-year for the period 1990-2003

INDC	YEAR														Total
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
BASIC (98)	30	29	30	32	46	57	72	94	125	141	171	191	188	82	1288
CYCGD+NCYCG (58)	47	46	46	52	54	63	70	79	102	109	123	146	143	67	1147
CYSER+NCYSR (36)	10	12	13	17	21	25	28	34	43	48	66	75	75	36	503
GENIN+ITECH (39)	18	17	19	20	23	27	32	38	60	71	83	93	94	46	641
RESOR+UTILS (6)	12	12	12	12	12	13	14	15	16	20	20	25	21	10	214
RLDEV* (17)	32	32	33	33	32	34	37	40	48	54	60	51	19	10	515
Total	149	148	153	166	188	219	253	300	394	443	523	581	540	251	4308

Note:

Figures in bracket are the number of IPO companies related to each industry grouping.

* Level 6 Datastream industry classification.

BASIC – Basic Industries.

CYCGD+NCYCG – Cyclical Consumer Goods and Non Cyclical Consumer Goods.

CYSER+NCYSR – Cyclical Services and Non Cyclical Services.

GENIN+ITECH – General Industrials and Information Technology.

RESOR+UTILS – Resources and Utilities.

RLDEV – Real Estate Development.

seasoned company refers to a company trading on the KLSE at any time during the period 1990 to 2003 that did not have an IPO in the previous three years.

After estimating the coefficients α_0 and α_1 from the current accruals model, the nondiscretionary accruals for each IPO company in each year are then predicted using the estimated coefficients α_0 and α_1 from each industry-year estimation portfolio. The nondiscretionary current accruals are the portion of current accruals that are not influenced by managerial discretion but are driven by the companies' sales growth.

From the model in equation 11.4, the nondiscretionary variables are the expected accruals; while the discretionary variables are residuals. Following Dechow *et al.* (1995) the change in trade receivables is subtracted from the change in sales to control for the possibility of credit sales manipulation by the issuer. The approach assumes that any change in the level of credit sales during the period reflects earnings management activity (Young, 1999). The nondiscretionary current accruals are then calculated as:

$$NDCA_{i,t} = \hat{\alpha}_0 \left(\frac{1}{TA_{i,t-1}} \right) + \hat{\alpha}_1 \left(\frac{\Delta Sales_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}} \right) \qquad (11.5)$$

where:

$\hat{\alpha}_0$ = *estimated intercept;*

$\hat{\alpha}_1$ = *the slope coefficient for IPO company i in year t;*

$\Delta Sales_{i,t}$ = *change in sales for IPO company i in year t;*

$\Delta TR_{i,t}$ = *the change in trade receivables for IPO company i in year t;*

$TA_{i,t-1}$ = *lagged total assets for IPO company i in year t.*

Finally, the discretionary current accruals (*DCA*), which are subject to managerial manipulation, are calculated as the difference between total current accruals and nondiscretionary current accruals. If non-zero *DCA* is observed, it can be interpreted that earnings management exists during the year. Positive *DCA* can be interpreted as income-increasing earnings management, and vice versa. The definition is:

$$DCA_{i,t} = \frac{CA_{i,t}}{TA_{i,t-1}} - NDCA_{i,t} \qquad (11.6)$$

where:

$CA_{i,t}$ = *current accruals of IPO company i in year t;*

$TA_{i,t-1}$ = *lagged total assets for IPO company i in year t;*

$NDCA_{i,t}$ = *nondiscretionary current accruals for IPO company i in year t.*

11.3.3 Measure of long run stock market performance

The present study relates the accruals from the first fiscal year financial statements of the IPO companies to the stock market performance starting from four months after the fiscal year end. Unfortunately, as illustrated in Part 1 of this thesis, the choice of measure of long run stock market performance is contentious. In the absence of a dominant method, compounded buy-and-hold returns are used. While the limitations of this approach are described in Chapter 5, Teoh *et al.* (1998a) suggest that buy-and-hold returns are more relevant for investors. The long run abnormal performance of IPO companies is estimated as the difference between the raw buy-and-hold return of an IPO company and the raw buy-and-hold return on the benchmark. Two benchmarks are employed: (i) the KL Composite Index (KLCI); and (ii) a matched company. The

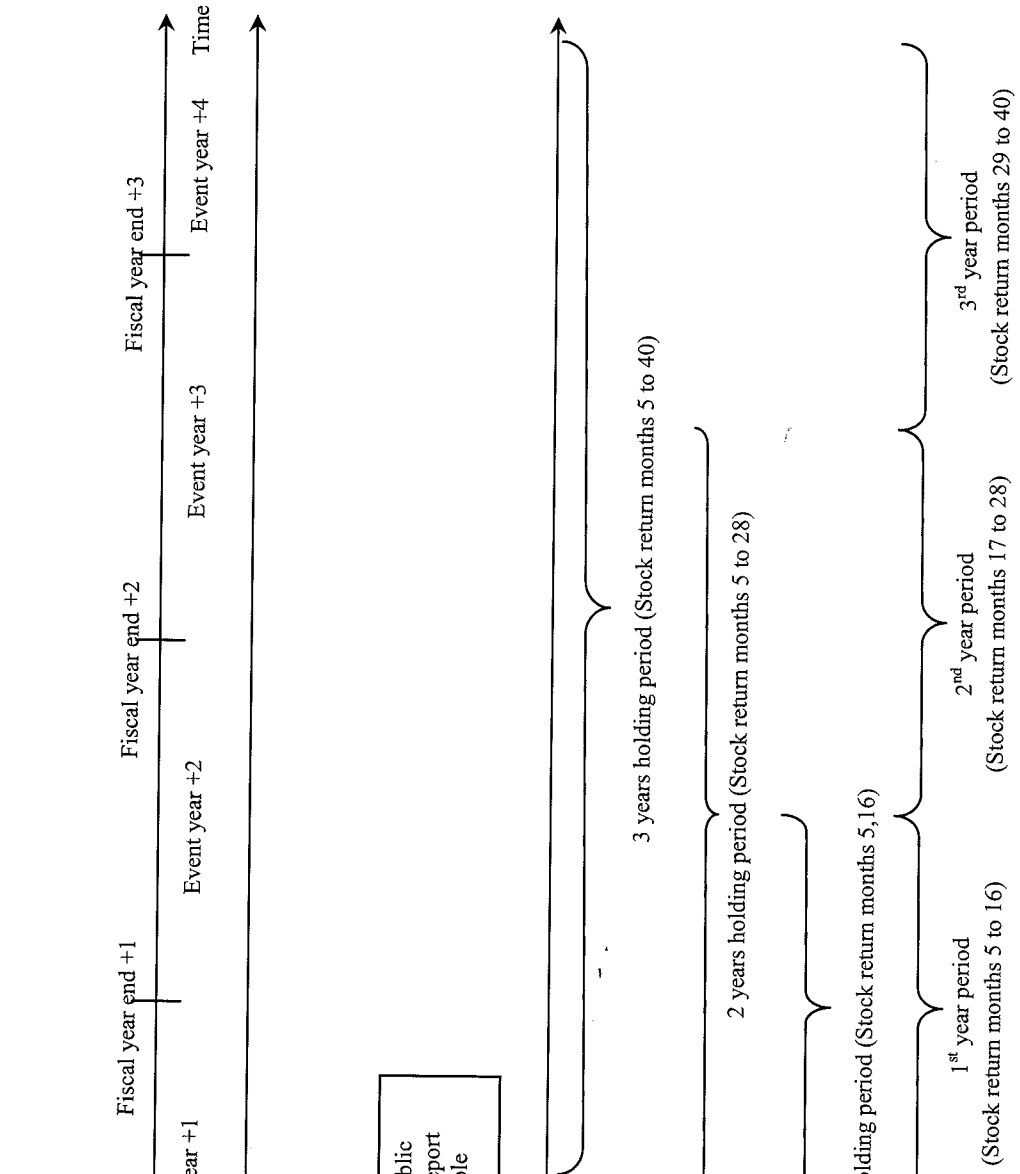
KLCI is used to represent the market benchmark. The matched company is chosen based on the same criteria identified in Chapter 8.

In Malaysia, companies are required to issue their annual audited financial statements within a period not exceeding four months after the close of their financial year. Therefore, the stock return data used in this study starts four months after the financial reporting date. It is assumed that the fourth month after fiscal year 0 is the month when the IPO companies make public their first annual report and allow for a reporting lag. This procedure is similar to the one used by Teoh *et al.* (1998a) and Roosenboom *et al.* (2003). Figure 11.1 illustrates the time line for stock return data due to this reporting lag.

11.3.4 Measure of post-IPO operating performance

The present study also relates discretionary accruals to accounting-based operating performance changes. Since in Part 2 of this thesis the accrual-based operating performance measure was found to exhibit a greater deterioration in performance, the analysis focuses only on this measure. In addition, many earnings management opportunities arise from the estimates and judgements inherent in the accrual accounting system (Wiedman, 2002). Two measures are used: (i) operating return on operating assets (OI/OA), and (ii) operating return on sales (OI/Sales). Detailed explanations of these measures are provided in Chapter 8.

Figure 11.1 Time line of earnings management and stock market analysis



11.3.5 Analysis undertaken and test statistics used

Two types of analyses are undertaken. The first analysis is of the time-series and cross-sectional patterns of earnings management. The second analysis is of the distribution of long run stock market and operating performance changes, based on the level of earnings management observed at the time of IPOs.

11.3.5.1 Time-series and cross-sectional patterns of earnings management

A similar time index as used in Chapter 8 is employed in the present study to analyse the time-series pattern of earnings management. The IPO year is coded as '0', the first, second, and third years after IPOs are coded as '+1, +2, and +3', respectively. The detailed timing convention is also explained in Figures 8.2 and 8.3. The cross-sectional pattern of IPO year earnings management is also analysed to investigate the impact of the Malaysian economic environment during the sample period. The earnings management observed at the time of IPOs (year 0) is segregated based on the year of listing (1990 to 2000).

The Wilcoxon signed-ranks test is used for the medians and the parametric *t*-test is adopted for the means to test whether the medians and means are statistically different from zero. In addition, the Kruskall-Wallis test is applied to assess whether there is evidence of variability in the median DCA over the sample period years of listing and Mann-Whitney U test is employed to test differences between individual years. The equivalent tests used for mean differences are ANOVA and Tukey HSD procedures.

11.3.5.2 Post-IPO performance changes by DCA quartiles

Univariate analysis of the long run stock market and operating performance changes is employed, based on the quartile of discretionary current accruals (DCA) observed at the time of IPOs. To do this, the IPO companies are ranked by their IPO year DCA, and are divided into quartiles, Q1 to Q4. Q1 is for the smallest DCA and is labelled as the 'conservative' quartile, while Q4 is the largest DCA and is labelled as the 'aggressive' quartile. The stock market returns are calculated for six[122] holding periods, as described in Figure 11.1. The Mann Whitney U test for median and the independent *t*-test for means are used to analyse the differences in post-IPO stock market and operating performance between Q1 and Q4.

11.4 Summary

The present chapter provides the research design applied to investigate the likelihood of earnings management around Malaysian IPOs and its association with the long run stock market and operating performance. The sample selection and sources of data employed in the present study are provided. This is followed by an explanation of the methods employed. The next chapter provides the analysis of earnings management and its association with IPO performance.

[122] Teoh *et al.* (1998a) and DuCharme *et al.* (2001) examine the stock returns for only one holding period (months 5 to 40) after IPOs, while Abdul Rahman and Wan Abdullah (2003) investigate the stock returns for three holding periods (first, second, and third year) after the IPO date.

Chapter 12

Results on earnings management and IPO performance

12.1 Introduction

Having reviewed the earnings management literature in Chapter 10 and described the research design in Chapter 11, this chapter provides the results concerning the existence of possible opportunistic earnings management by Malaysian IPO companies' managers around the offerings. The time-series and cross-sectional patterns of earnings management are reported first, followed by the analysis of the distribution of the stock market and operating performance changes by the IPO year discretionary current accrual (DCA) quartiles. The final section summarises the present chapter.

12.2 Time-series and cross-sectional patterns of earnings management

Table 12.1 presents the evidence for the likelihood of earnings management around the Malaysian IPOs. This table reports the time-series profile of discretionary current accruals (DCA) that are used to proxy for the earnings management, in percent, from the fiscal year of the IPOs to three years after. All values are expressed as a percentage of lagged total assets.

The median (mean) DCA is higher at the time of the IPOs (year 0), at 3.24% (5.74%) of lagged total assets, then declines steadily to -0.56% (-0.05%) in year +3. The present study relies on the medians for statistical inference since some skewness is indicated in the sample by a higher mean measure than median measure in year 0. In addition, the test of normality based on the Kolmogorov-Smirnov statistic of 0.156 (p-value = 0.000)

indicates that the data differs significantly from a normal distribution, thus violating one of the assumptions of parametric tests.[123]

Table 12.1 The median and mean levels of discretionary current accruals (DCA)*

	% of lagged total assets			
	Year 0	**Year +1**	**Year +2**	**Year +3**
Median	3.24[a]	1.47[b]	1.36	-0.56
p-value	0.001	0.023	0.104	0.860
Mean	5.74[a]	3.47[b]	0.11	-0.05
p-value	0.007	0.019	0.970	0.978
Number of companies	254	254	254	254

Note:

[a and b] Significantly different from zero at the 0.01 and 0.05 levels, respectively, using a two-tailed test.

The Wilcoxon signed-ranks test is used for the medians and the parametric *t*-test is used for means.

* Test of normality for DCA at year 0: Kolmogorov-Smirnov statistic = 0.156 (p-value = 0.000).

The results of the present study strongly support the likelihood of earnings management at the time of IPOs, indicated by a significant positive (at the 1% level) DCA. The level of earnings management at the time of IPO is slightly lower than the results observed by Teoh *et al.* (1998), Teoh *et al.* (1998a), and Roosenboom *et al.* (2003), who reported median values of 5.5%, 4.0%, and 3.9%, both two in the US and Netherlands, respectively. However, as reported by Roosenboom *et al.* (2003), other studies have observed similar levels of earnings management, ranging from 1.5% to more than 5% of lagged total assets. The level of earnings management is still significantly positive (at the 5% level) in the first year after the IPOs. This indicates that Malaysian IPO companies manage their earnings upward through working capital accruals at the time of going public, and maintain their earnings for the fiscal year immediately after the IPOs. This result is similar to Teoh *et al.* (1998), and Teoh *et al.* (1998a), who found a significant decline but positive DCA of 1.60% and 2.24% respectively in year +1.

[123] Another two assumptions of parametric tests are independence of observations (serial correlation) and equality of variance.

However, the result of the present study contradicts those of Roosenboom *et al.* (2003), who found a significant decline and a negative DCA of -4.4% in year +1. The continuance of earnings management in the post-IPO year may reflect managers' needs to ensure that actual earnings are close to those forecast in the IPO prospectus and also in the two years of maintainable earnings following the IPOs. As discussed in Chapter 2, the mandatory requirement to provide earnings forecasts and the provision of profit guarantees by certain Main Board applicant companies and all Second Board companies to meet 90% of the profit forecast in the prospectus and 90% of the forecast profits for the two years following the IPOs are unique to the Malaysian environment.

Overall, the evidence reported in Table 12.1 is consistent with Teoh *et al.* (1998) and Teoh *et al.* (1998a), and suggests that the managers of Malaysian IPO companies opportunistically advance accruals in an attempt to improve earnings during the IPO year. However, the high level of DCA in the IPO year is not sustained in the post-IPO years. Thus, the evidence provides a possible explanation for the observed decline in operating performance reported in Chapter 9.

The sample period of the present study includes the East Asian crisis period of 1997 and 1998. Given that accounting earnings convey information about company values to investors (DuCharme *et al.*, 2004), earnings management might be more prevalent in such a period of high uncertainty; managers might perceive a greater need to increase investors' confidence in their new share offerings. Thus, it is interesting to investigate whether earnings management is affected by the economic environment at the time of the IPO.

Table 12.2 shows the distribution of the mean and median DCA in the IPO year, classified by year of listing. There are four outlier IPO companies (one each in 1991 and 1998, and two in 1993) that exhibit extreme levels of DCA (taken as those which have a DCA lower than the first quartile minus three times the interquartile range, or higher than the third quartile plus three times interquartile range) and serve to distort the results based on means. Results are reported for the full data set and also for a reduced data set excluding these four IPOs. However, the inference is also based on medians since the normality test on the DCA data, even after outlier removal, still shows that the data are not normally distributed (Kolmogorov-Smirnov statistic = 0.091, p-value = 0.000).

Table 12.2 Distribution of IPO year DCA classified by year of listing

	Full sample, 254 IPOs					Reduced sample, 250 IPOs				
	DCA at year 0 (% of lagged total assets)					DCA at year 0 (% of lagged total assets)				
Year of listing	n	Median* (%)	p-value	Mean^ (%)	p-value	n	Median# (%)	p-value	Mean+ (%)	p-value
1990	16	-0.32	0.856	-1.31	0.768	16	-0.32	0.856	-1.31	0.768
1991	17	-0.78	1.000	15.19	0.421	16	-1.72	0.660	-2.73	0.539
1992	19	0.66	0.825	-3.24	0.534	19	0.66	0.825	-3.24	0.534
1993	20	2.70	0.271	1.79	0.842	18	2.70	0.191	4.22	0.225
1994	29	4.67	0.289	0.47	0.920	29	4.67	0.289	0.47	0.920
1995	22	-0.69	0.820	-1.84	0.735	22	-0.69	0.820	-1.84	0.735
1996	46	0.87	0.129	5.32[c]	0.067	46	0.87	0.129	5.32[c]	0.067
1997	43	10.00[a]	0.001	9.78[a]	0.000	43	10.00[a]	0.001	9.78[a]	0.000
1998	15	19.58[b]	0.016	29.87[c]	0.094	14	18.35[b]	0.028	14.07[b]	0.023
1999	11	-5.35	0.450	-5.22	0.349	11	-5.35	0.450	-5.22	0.349
2000	16	3.58	0.103	13.57	0.121	16	3.58	0.103	13.57	0.121
Total	254	3.24[a]	0.001	5.74[a]	0.007	250	2.92[a]	0.001	3.78[a]	0.006

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05 and 0.10 levels, respectively, using a two-tailed test. The Wilcoxon signed-ranks test is used for the medians and the parametric *t*-test is used for means.

* Kruskal Wallis test for median difference for all years (Chi-Square = 19.246, p-value=0.037).

^ Oneway ANOVA test for mean differences for all years (F = 1.610, p-value = 0.104).

\# Kruskal Wallis test for median difference for all years (Chi-Square = 19.061, p-value=0.039).

\+ Oneway ANOVA test for mean differences for all years (F = 1.955, p-value = 0.039).

Interestingly, as shown in Table 12.2, median earnings management is higher for IPOs in 1997 and 1998 (statistically significant at the 1% and 5% levels respectively) for both samples. During the crisis period of 1997 and 1998, investors may have been more selective in buying the shares of the better performing companies. The high positive DCA during this period is as hypothesised, since IPO companies may manage their earnings to attract investors to buy their shares, as well as increase investors' confidence that good performance will be sustained.

The results of further tests as to whether some years are different from others are reported at the bottom of Table 12.2. With p-values of 0.037 and 0.039 obtained from the Kruskal-Wallis test for the full sample and the reduced sample, respectively, it can be said that at least one of the years has a significantly different median DCA from the others. However, when oneway ANOVA is performed, none of the years has a statistically significant different mean DCA from the others (p-value = 0.104) for the full sample, although for the reduced sample, at least one of the years is significantly different from the rest of the years (p-value = 0.039). Due to the non-normality in the data, as mentioned earlier, this study relies on median results in making statistical inferences.

Since the years 1997 and 1998 are found to show higher levels of earnings management than the remaining years, it is interesting to further investigate whether these two years are different from each of the other sample years. Table 12.3 reports the results for the full sample and the reduced sample. The difference between 1997 and each of the sample years is reported in the top part of the table, while the results for 1998 are reported in the bottom part. Focusing first on year 1997, six out of ten years are statistically significantly different in the median level of earnings management from

year 1997 for both samples. Similarly, it is found that earnings management for seven out of ten years is statistically significantly different from year 1998. However, the results based on the Tukey HSD procedure of ANOVA indicates that none of the years has earnings management that is statistically significant from either 1997 or 1998 in both samples. In sum, the results suggest that earnings management is higher during the East Asian crisis years of 1997 and 1998, and at least one of the years is significantly different from the rest of the years. There is also evidence that the level of earnings management in years 1997 and 1998 is significantly different from that recorded for several of the sample years examined.

Table 12.3 Median and mean difference of IPO year DCA between two different years of listing

Difference		Full sample, 454 IPOs				Reduced sample, 450 IPOs			
		Median tests		Mean tests		Median tests		Mean tests	
Year A	vs. year B	*z*-stat for difference (A-B)	p-value	Mean difference (A-B)	p-value	*z*-stat for difference (A-B)	p-value	Mean difference (A-B)	p-value
1997	1990	2.13[b]	0.033	11.09	0.988	2.13[b]	0.033	11.09	0.776
	1991	2.30[b]	0.021	-5.41	1.000	2.30[b]	0.021	12.51	0.624
	1992	2.56[b]	0.011	13.02	0.944	2.56[b]	0.011	13.02	0.471
	1993	1.03	0.303	8.00	0.998	1.41	0.159	5.57	0.997
	1994	1.58	0.114	9.31	0.986	1.58	0.114	9.31	0.751
	1995	1.89[c]	0.059	11.62	0.963	1.89[c]	0.059	11.62	0.570
	1996	1.72[c]	0.085	4.47	1.000	1.72[c]	0.085	4.47	0.996
	1998	-1.22	0.221	-20.08	0.646	-1.22	0.221	-4.29	1.000
	1999	2.29[b]	0.022	15.00	0.963	2.29[b]	0.022	15.00	0.567
	2000	0.12	0.905	-3.79	1.000	0.12	0.905	-3.79	1.000
1998	1990	2.20[b]	0.028	31.18	0.256	2.20[b]	0.028	15.39	0.647
	1991	2.54[b]	0.011	14.67	0.977	2.54[a]	0.011	16.80	0.516
	1992	2.62[a]	0.009	33.10	0.139	2.62[a]	0.009	17.31	0.409
	1993	1.46	0.145	28.08	0.333	1.79	0.074	9.86	0.965
	1994	2.02[b]	0.043	29.40	0.178	2.02[b]	0.043	13.60	0.655
	1995	2.01[b]	0.044	31.70	0.152	2.01[b]	0.044	15.91	0.495
	1996	1.96[b]	0.050	24.55	0.327	1.96[b]	0.050	8.76	0.955
	1997	1.22	0.221	20.08	0.646	1.22	0.221	4.29	1.000
	1999	2.35[b]	0.019	35.09	0.232	2.35[b]	0.019	19.29	0.450
	2000	0.71	0.480	16.30	0.957	0.71	0.480	0.50	1.000

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05 and 0.10 levels, respectively, using a two-tailed test. The Mann-Whitney U test is used for the medians and the Tukey HSD procedure of ANOVA is used for means.

Due to the fact that companies that went public in the East Asian crisis years 1997 and 1998 show higher levels of earnings management than in the rest of the sample period, the study further investigates whether these companies are those that voluntarily or non-voluntarily chose the three-year profit guarantee agreements. The profit guarantee regulation, as explained in Section 2.3, is one of the unique features of Malaysian IPOs. It is expected that Malaysian companies manage their earnings to meet the guaranteed profits reported in their prospectuses (first guaranteed profit - DCA year 0) and the following two financial years (second and third guaranteed profits - DCA year +1 and DCA year +2).

Table 12.4 Number of companies reporting a three-year profit guarantee (optionally or mandatory)

Year	1997		1998		Combined year (1997&1998)		
	MB	SB	MB	SB	MB	MB	Total
Profit Guarantee	0	25	0	12	0	37	37
No Profit Guarantee	7	8	3	0	10	8	18
Missing prospectus	2	1	0	0	2	1	3
Number of companies	9	34	3	12	12	46	58

Source: IPO prospectuses.

Table 12.4 shows the breakdown of IPO companies that voluntarily (Guidance Notes 10-19 on 1 January 1996) and non-voluntarily (Updates and Revisions to the Policies on Issues/Offer of Securities on 1 July 1997) choose to provide the profit guarantee. None of them are from the Main Board, since the Main Board applicant companies only have an *optional* rather than a *mandatory* requirement to provide the profit guarantee. There were 37 (25 in 1997 and 12 in 1998) Second Board applicant companies that provided the profit guarantee (optionally or mandatory). However, there were 15 companies in 1997 (seven Main Board and eight Second Board application companies) and only three Main Board applicant companies in 1998 that did not report the voluntarily and

non-voluntarily profit guarantee requirements. None of the companies in 1998 are from the Second Board since the profit guarantee has been a *mandatory* requirement for those Second Board applicant companies since 1 July 1997.

Table 12.5 shows the level of earnings management for the companies which reported profit guarantee for the years 1997 and 1998 both voluntarily and non-voluntarily. As can be seen from Panel A, profit guarantee companies for the year 1997 have high levels of earnings management during their first (DCA year 0) and second (DCA year +1) guaranteed fiscal year end, which are statistically significant at the 1% and 10% levels, respectively. As hypothesised, companies managed their earnings during these years, not merely due to the economic crisis but also due to the requirement to meet their first and second guaranteed profits.

However, they are no longer engaged in earnings management in the third guaranteed (DCA year +2) and no guaranteed (DCA year +3) fiscal year end. The non-profit guarantee companies also appear to engage in earnings management but only with a low significance level up to their first fiscal year end (DCA year 0). The high level of earnings management for the non-profit guarantee companies up to their first fiscal year end may be due to the need to increase investors' confidence in their companies' performance because of the economic crisis. However, there is no significant difference in the level of earnings management between the profit guarantee companies and the non-profit guarantee companies for all fiscal year ends (DCA year 0 to DCA year +3).

Table 12.5 Earnings management by profit guarantee and non-profit guarantee companies

	DCA YR 0 *1st guaranteed*	DCA YR +1 *2nd guaranteed*	DCA YR +2 *3rd guaranteed*	DCA YR +3 *No guaranteed*
Panel A: Year 1997				
Profit guarantee (n=25)				
Median	8.76[a]	5.60[c]	-0.57	-2.09
p-value	0.007	0.090	0.554	0.647
Mean	8.61[a]	4.74[c]	-2.95	6.26
p-value	0.006	0.067	0.320	0.204
Non-profit guarantee (n=15)				
Median	10.00[c]	-0.19	-2.74	-2.49
p-value	0.083	0.932	0.977	0.410
Mean	9.61[c]	1.12	0.41	-12.4
p-value	0.075	0.713	0.909	0.305
z-stat for difference	-0.27	1.10	0.15	0.52
p-value for difference	0.802	0.276	0.889	0.615
t-stat for difference	-0.18	0.93	-0.74	1.48
p-value for difference	0.862	0.358	0.467	0.155
Panel B: Year 1998				
Profit guarantee (n=12)				
Median	22.23[b]	5.43	5.78[c]	1.59
p-value	0.021	0.784	0.065	1.000
Mean	37.61[c]	0.65	11.55	-3.59
p-value	0.090	0.899	0.101	0.529
Non-profit guarantee (n=3)				
Median	0.02	-9.22	-3.98	4.20
p-value	1.000	0.181	0.789	0.789
Mean	-1.11	-10.09[b]	-3.64	1.92
p-value	0.896	0.012	0.721	0.760
z-stat for difference	1.88[c]	1.30	0.87	-0.58
p-value for difference	0.071	0.220	0.427	0.613
t-stat for difference	1.80[c]	2.08[c]	1.39	-0.71
p-value for difference	0.098	0.062	0.238	0.506
Panel C: Year 1997 & 1998				
Profit guarantee (n=37)				
Median	11.62[a]	5.60	2.37	-0.33
p-value	0.000	0.135	0.556	0.809
Mean	18.01[b]	3.41	1.75	3.07
p-value	0.015	0.149	0.567	0.417
Non-profit guarantee (n=18)				
Median	8.86[c]	-1.71	-3.21	-1.56
p-value	0.098	0.514	0.862	0.601
Mean	7.83[c]	-0.75	-0.26	-9.97
p-value	0.092	0.784	0.935	0.319
z-stat for difference	1.04	1.47	0.59	0.36
p-value for difference	0.302	0.144	0.560	0.727
t-stat for difference	1.23	1.17	0.46	1.25
p-value for difference	0.224	0.247	0.649	0.224

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05 and 0.10 levels, respectively, using a two-tailed test. The Wilcoxon signed-ranks test is used for the medians and the parametric *t*-test is used for the means. The difference in median and mean DCA between profit guarantee and non-profit guarantee companies is based on the Mann-Whitney U test and the independent *t*-test.

With regard to the IPO companies in the year 1998, the profit guarantee companies have a high level of earnings management during the three guaranteed years (statistically significant at the 1% and 10% levels, respectively, in the first and third guaranteed fiscal year ends). Interestingly, there is no evidence that the small number of non-profit guarantee companies engage in earnings management during the same period. However, only the first guaranteed fiscal year end exhibits a statistically significant level of earnings management between the profit guarantee and non-profit guarantee companies.

To improve the reliability of results due to the small sample, Panel C reports the level of earnings management by combining the sample companies in 1997 and 1998. As can be seen from this Panel, profit guarantee companies have high levels of earnings management in the first, second and third guaranteed years, statistically significant at the 1% level for the first guaranteed year. On the other hand, non-profit guarantee companies have high level of earnings management only in the first guaranteed year, which is significant at the 10% level. In addition, none of the fiscal year ends show a statistically significant level of earnings management between the profit guarantee and non-profit guarantee companies.

As reviewed in Chapter 10, another motivation for earnings management is to increase the offer price of the shares sold and companies' value by increasing earnings. The worth of the shares retained by the owners will increase and more cash will be received by them in a secondary share issue. The incidence of high retained ownership on the Malaysian market, observed in Chapter 9, has drawn attention to the need to further investigate the distribution of earnings management across ownership retention categories. Managers that retained less (*more*) shares post-IPO (i.e. sell more (*less*)

shares) are expected to engage in high earnings management to increase the worth of their shares.

Table 12.6 Distribution of IPO year DCA classified by median ownership retention

Ownership retention	Full sample, 254 IPOs					Reduced sample, 250 IPOs				
	DCA at year 0 (% of lagged total assets)					DCA at year 0 (% of lagged total assets)				
	n	Median (%)	p-value	Mean (%)	p-value	n	Median (%)	p-value	Mean (%)	p-value
Below median alpha: (alpha<79.24%)	127	0.98	0.955	-1.21	0.546	126	1.03	0.832	-0.16	0.920
Above median alpha: (alpha>79.24%)	127	6.24[a]	0.000	12.69[a]	0.001	124	5.59[a]	0.000	7.80[a]	0.000
z-stat / *t*-stat for difference (above-below median alpha)		-3.653[a]		-3.343[a]			-3.299[a]		-2.995[a]	
p-value (above-below median alpha)		0.000		0.001			0.001		0.003	
Total	254	3.24[a]	0.001	5.74[a]	0.007	250	2.92[a]	0.001	3.78[a]	0.006

Note:

[a] Significantly different from zero at the 0.01 level, using a two-tailed test. The Wilcoxon signed-ranks test is used for the medians and the parametric *t*-test is used for the means. The difference in median and mean DCA between below and above median ownership retention companies is based on the Mann-Whitney U test and the independent *t*-test.

Table 12.6 shows the distribution of mean and median DCA in the IPO year, classified by median ownership retention. Similar to Table 12.2, the results are reported for the full data set and also for a reduced data set (excluding four outliers). Contrary to expectations, managers with higher share retention post-IPO are found to have a higher level of earnings management for both samples (statistically significant at the 1% level). There is also a significant difference in the level of earnings management between the high and low ownership retention groups. This rather puzzling result is inconsistent with the results reported by Marquardt and Wiedman (2004a) who found that US companies whose management sell their own shares in SEOs have higher earnings management than companies where management does not sell.

In sum, it appears that Malaysian IPO companies managed their earnings during the East Asian crisis period of 1997 and 1998 to attract investors and improve confidence in

their companies' performance. There is also some (weak) evidence that they did so to meet their requirement to provide guaranteed profits for three years. In addition, managers with higher share retention post-IPO are found to have a higher level of earnings management.

12.3 Association between earnings management and post-IPO performance

The association between DCA and post-IPO performance is examined to see whether companies with high levels of earnings management at the time of the IPO experience a greater deterioration in their stock market and operating performance in subsequent years. This section provides an analysis of the post-IPO performance by DCA quartiles (Q1 to Q4). Q1 refers to 'conservative' IPOs (IPO companies with the lowest DCA) and Q4 refer to 'aggressive' IPOs (IPO companies with the highest DCA). The conservative quartile (Q1) has a DCA of less than -6%, Q2 has a DCA of -6% to +3%, Q3 has a DCA of +3% to 15%, and the aggressive quartile (Q4) has a DCA exceeding 15%. Section 12.3.1 and Section 12.3.2 provide the analyses of the stock market performance and the operating performance, respectively.

12.3.1 Post-IPO stock market performance

Table 12.7 reports the data on long run stock market performance by DCA quartile using market and matched company benchmarks. Panel A shows the median and mean raw IPO returns (top) and the buy-and-hold abnormal returns (*BHAR*s) using a market benchmark (middle) and a matched company benchmark (bottom). The returns are

calculated for 12-, 24-, and 36-month periods commencing immediately at the beginning of the fifth month of the IPO year fiscal year end to allow for a reporting lag.

Panel B shows the results for the first (months 5 to 16), second (months 17 to 28), and third (months 29 to 40) years. The *BHAR*s for each IPO company are computed as the raw IPO return minus the equivalent period KL Composite Index return or matched company return.

It is hypothesised that companies that engage in more aggressive earnings management at the time of IPOs experience worse subsequent stock market performance. As can be seen from Table 12.7, the raw IPO returns are only negative in the three-year holding periods (months 5 to 40). The aggressive IPO companies underperform the conservative IPO companies by -7.7% (-24.03% for Q4 *minus* -16.33% for Q1) in median raw returns for this period. However, this underperformance is not statistically significant (z-statistic for difference = -0.52).

Table 12.7 The median and mean buy-and-hold returns by DCA quartiles

Panel A:	BHR% [5,16]					BHR% [5,28]					BHR% [5,40]				
Holding period returns from month 5	All	Q1 Cons.	Q2	Q3	Q4 Aggr.	All	Q1 Cons.	Q2	Q3	Q4 Aggr.	All	Q1 Cons.	Q2	Q3	Q4 Aggr.
IPO company															
Median	12.96[a]	9.12[c]	1.91	28.10[a]	19.75[a]	13.34[a]	-7.90	-9.11	23.82[a]	22.37[a]	-15.62	-16.33	-20.55	-1.44	-24.03
p-value	0.001	0.096	0.514	0.004	0.005	0.000	0.232	0.912	0.001	0.010	0.489	0.545	0.854	0.137	0.496
z-stat for diff (Q4-Q1)			0.84					1.08					-0.52		
p-value (Q4-Q1)			0.401					0.282					0.603		
Mean	21.26[a]	18.92[b]	-0.47	32.88[a]	33.87[a]	41.48[a]	28.88[c]	22.05	52.85[a]	62.27[b]	31.66[a]	38.32[c]	25.31	38.67[b]	24.31
p-value	0.000	0.048	0.959	0.001	0.005	0.000	0.055	0.145	0.000	0.020	0.001	0.074	0.197	0.017	0.189
t-stat for diff (Q4-Q1)			1.00					1.12					-0.50		
p-value (Q4-Q1)			0.319					0.268					0.616		
Market-adjusted															
Median	-2.33	5.26	-7.18	2.31	-3.81	-16.93	-21.53	-22.66	2.48	-18.77	-26.72[a]	-22.88	-30.36[b]	-9.71	-34.59[b]
p-value	0.436	0.266	0.128	0.112	0.894	0.682	0.856	0.401	0.203	0.624	0.003	0.219	0.030	0.981	0.016
z-stat for diff (Q4-Q1)			-0.86					0.18					-1.88[c]		
p-value (Q4-Q1)			0.389					0.857					0.061		
Mean	11.88[a]	15.58[b]	-0.68	19.52[b]	13.19	22.30[a]	13.65	12.57	28.91[b]	34.13	12.61	22.81	8.80	16.13	2.69
p-value	0.003	0.037	0.921	0.011	0.191	0.005	0.206	0.346	0.020	0.161	0.124	0.226	0.628	0.182	0.869
t-stat for diff (Q4-Q1)			-0.19					0.78					-0.81		
p-value (Q4-Q1)			0.848					0.438					0.418		
Matched company-adjusted															
Median	2.60	6.66[b]	0.68	8.63[c]	-14.07	2.72	0.19	-2.72	15.19[c]	-12.13	-4.99	1.67	-13.01	13.53	-19.71[b]
p-value	0.490	0.040	0.618	0.084	0.123	0.364	0.704	0.997	0.024	0.487	0.525	0.724	0.230	0.155	0.034
z-stat for diff (Q4-Q1)			-2.59[a]					-0.90					-1.68[c]		
p-value (Q4-Q1)			0.010					0.371					0.093		
Mean	5.46	18.14[b]	-1.51	14.11[c]	-8.93	9.75	9.84	5.36	24.30	-0.67	10.29	21.71	3.73	24.95[c]	-9.38
p-value	0.247	0.018	0.830	0.083	0.512	0.310	0.480	0.715	0.102	0.982	0.271	0.300	0.846	0.084	0.641
t-stat for diff (Q4-Q1)			-1.75[c]					-0.32					-1.08		
p-value (Q4-Q1)			0.083					0.748					0.283		
Number of companies	254	63	64	64	63	254	63	64	64	63	254	63	64	64	63

continued on next page

Table 12.7 (*continued*) The median and mean buy-and-hold returns by DCA quartiles

Panel B: *Annual holding period returns*	BHR% [5,16] All	Q1 Cons.	Q2	Q3	Q4 Aggr.	BHR% [17,28] All	Q1 Cons.	Q2	Q3	Q4 Aggr.	BHR% [29,40] All	Q1 Cons.	Q2	Q3	Q4 Aggr.
IPO company															
Median	12.96[a]	9.12[c]	1.91	28.10[a]	19.75[a]	18.19[a]	20.32[c]	19.13[a]	20.13[a]	2.00[c]	2.84	4.44[b]	20.69[c]	-4.28	-5.11
p-value	0.001	0.096	0.514	0.004	0.005	0.000	0.067	0.007	0.004	0.083	0.224	0.043	0.076	0.939	0.323
z-stat for diff (Q4-Q1)			0.84					-0.06					-2.12[b]		
p-value (Q4-Q1)			0.401					0.955					0.034		
Mean	21.26[a]	18.92[b]	-0.47	32.88[a]	33.87[a]	26.04[a]	22.46[c]	26.04[a]	33.79[a]	21.74[b]	15.94[a]	27.34[b]	25.57[b]	9.16	1.64
p-value	0.000	0.048	0.959	0.001	0.005	0.000	0.074	0.002	0.002	0.016	0.004	0.023	0.022	0.412	0.869
t-stat for diff (Q4-Q1)			1.00					-0.05					-1.67[c]		
p-value (Q4-Q1)			0.319					0.962					0.098		
Market-adjusted															
Median	-2.33	5.26	-7.18	2.31	-3.81	1.52[b]	-6.36	4.86	2.75	5.44	-6.94	2.29	-4.90	-11.98	-14.31[b]
p-value	0.436	0.266	0.128	0.112	0.894	0.049	0.851	0.126	0.220	0.217	0.383	0.123	0.581	0.567	0.043
z-stat for diff (Q4-Q1)			-0.86					1.04					-2.64[a]		
p-value (Q4-Q1)			0.389					0.300					0.008		
Mean	11.88[a]	15.58[b]	-0.68	19.52[b]	13.19	12.76[a]	7.89	13.78[c]	18.05[b]	11.22	9.44[b]	20.36[c]	11.30	7.19	-1.11
p-value	0.003	0.037	0.921	0.011	0.191	0.002	0.405	0.054	0.038	0.104	0.033	0.055	0.214	0.378	0.883
t-stat for diff (Q4-Q1)			-0.19					0.29					-1.68[c]		
p-value (Q4-Q1)			0.848					0.775					0.097		
Matched company-adjusted															
Median	2.60	6.66[b]	0.68	8.63[c]	-14.07	2.48	-4.83	8.63	1.08	6.37	-1.94	7.10	-5.46	5.56	-7.38
p-value	0.490	0.040	0.618	0.084	0.123	0.123	0.35	0.187	0.235	0.155	0.960	0.162	0.187	0.308	0.212
z-stat for diff (Q4-Q1)			-2.59[a]					1.66[c]					-1.89[c]		
p-value (Q4-Q1)			0.010					0.096					0.059		
Mean	5.46	18.14[b]	-1.51	14.11[c]	-8.93	4.77	0.47	7.67	9.55	1.25	3.97	14.11	-4.52	10.05	-3.74
p-value	0.247	0.018	0.830	0.083	0.512	0.352	0.968	0.391	0.353	0.902	0.442	0.230	0.706	0.288	0.626
t-stat for diff (Q4-Q1)			-1.75[c]					0.05					-1.28		
p-value (Q4-Q1)			0.083					0.960					0.203		
Number of companies	254	63	64	64	63	254	63	64	64	63	254	63	64	64	63

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05 and 0.10 levels, respectively, using a two-tailed test. The Wilcoxon signed-ranks test is used for the medians and the parametric *t*-test is used for means. The market-adjusted or the matched company-adjusted is calculated as IPO company's return minus the market's (KL Composite Index) return or the matched company's return, respectively. The difference in median and mean return between Q1 and Q4 is based on the Mann-Whitney U test and the independent *t*-test.

As can be observed from the middle part of Panel A, IPO companies overall underperform the market benchmark in the one-, two-, and three-year holding periods but the underperformance is only significantly different (at the 1% level) in the three-year holding period, with a median *BHAR* of -26.72%. Analysis of the magnitude of the three-year *BHAR* based on the IPO year DCA quartiles indicates that aggressive earnings management IPOs (Q4) underperform more than the conservative earnings management IPOs (Q1). The results of the Mann-Whitney U test, which tests the difference in medians between Q1 and Q4 for the three-year holding period, show that the difference between them is weakly significant at the 10% level (*z*-statistic for difference = -1.88). This result is consistent with the results reported by Teoh *et al.* (1998a) and Roosenboom *et al.* (2003) who found that the aggressive IPOs underperform the conservative IPOs in raw returns and market-adjusted returns for the holding periods from five to forty months after the release of the first post-IPO financial statement. However, the results cannot be compared to the one- and two-year holding periods since these were not reported by them.

The distorting impact of outliers on mean performance is illustrated in the results based on market-adjusted returns. Confirmation that this is an outlier effect was obtained by calculating median and mean *BHAR*s for the three-year holding period (months 5 to 40) after removing the extreme outlier companies. The procedure used to remove the outliers is similar to the one used in Section 12.2. After removing 10 outliers, the median and mean *BHAR*s for the three-year holding period were now both negative at -28.21% and -8.25% (significant at 1% and 10% levels), respectively. Interestingly, the mean *BHAR*s (months 5 to 40) for Q1, Q2, and Q4 were all now negative, with values of -9.12%, -12.12%, and -15.68%, respectively. However, Q3 has a mean *BHAR* of 3.86%.

To ensure the robustness of the results, the matched company benchmark is also used to adjust the IPO company returns, and the results are reported in the bottom part of Panel A. In general, IPO companies slightly *over*perform the matched companies in the one and two-year holding periods, with median *BHAR*s of 2.60% and 2.72% respectively. There is a slight underperformance in the three-year holding period (median *BHAR* = -4.99%) but this is not statistically different from zero. Consistent with the results observed when the market benchmark is used, aggressive earnings management IPOs are found to significantly underperform their matched companies from months 5 to 40 (*BHAR* = -19.71%), while IPO companies in the conservative group do not underperform (*BHAR* = 1.67%). However, the quartile returns are non-monotonic in all holding periods. Interestingly, the present study finds that the aggressive earnings management group (Q4) leads to poor stock market performance in all three different holding periods as compared to the Q1 group when their returns are adjusted for the returns on the matched companies. However, only the difference between the *BHAR* of Q1 and the *BHAR* of Q4 is statistically significant at the 1% and 10% levels for the one-year and three-year holding periods, respectively.

In order to check when the underperformance occurs, the annual holding period returns are also analysed. The results are reported in Panel B of Table 12.7. The IPO companies produce positive median raw returns in the first-, second- and third-year holding periods. However, the IPO companies appear to underperform the market in the first- and third-year holding periods, with median market-adjusted buy-and-hold returns of -2.33% and -6.94%, respectively, although none of them are statistically significantly different from zero.

Analysis of the magnitude of the difference in returns between aggressive and conservative IPOs indicates that the aggressive IPOs only underperform the conservative IPOs in their median raw returns by -18.32% and -9.55% in the second (months 17 to 28) and third (months 29 to 40) years, respectively. However, the median differences in raw returns between Q1 and Q4 groups are only significant in the third-year holding period. When the raw IPO returns are adjusted by the market returns, the aggressive IPO only underperforms the conservative IPO in the third-year holding period. For example, the aggressive IPO significantly underperform the market with a *BHAR* of -14.31%, while conservative IPOs insignificantly *over*perform the market benchmark, with a *BHAR* of 2.29%. The test of the median difference of *BHAR*s between Q1 and Q4 in the third-year holding period shows that the difference is statistically significant at the 1% level (*z*-statistic for difference = -2.64). However, there are no clear patterns to suggest that the aggressive IPOs underperform the conservative IPOs in the first- and second-year holding periods when the market benchmark is used.

IPO companies insignificantly underperform their matched companies in the third year, with a *BHAR* of -1.94%. The aggressive earnings management group (Q4) is found to underperform their matched companies more than the conservative earnings management group (Q1) in the first- and third-year holding periods, with a median difference in *BHAR*s between both groups that is statistically significant at the 1% and 10% levels, respectively.

As seen from the table, the raw and adjusted buy-and-hold returns in each quartile are non-monotonic except for the *BHAR* in the third-year holding period (months 29 to 40), when the market benchmark is used. Similar non-monotonic patterns are also observed

by Teoh *et al.* (1998a) and DuCharme *et al.* (2001). However, their studies analysed the stock market performance only for the three-year period from 5 to 40 months following the end of the fiscal year of the IPOs.

In sum, the results suggest that there is some evidence that Malaysian IPO companies underperform the market or matched companies in the long run. This underperformance can be observed only for longer holding periods (months 5 to 40) and occurs the most in the third-year holding period (months 29 to 40). There is evidence that aggressive earnings management at the time of IPOs leads to poor long run stock market performance. However, the weaker stock market performance for the aggressive earnings management group is observed only when longer holding periods returns are investigated (months 5 to 40), which is consistent with the reported results by Teoh *et al.* (1998a), Teoh *et al.* (1998), DuCharme *et al.* (2001) and Roosenboom *et al.* (2003). Unfortunately, comparison with a shorter holding period cannot be made since no results were reported by these studies. In addition, there are non-monotonic trends in quartiles returns, which are also observed by Teoh *et al.* (1998a), DuCharme *et al.* (2001) and Roosenboom *et al.* (2003).[124]

12.3.2 Post-IPO operating performance

Tables 12.8 and 12.9 provide an analysis of whether post-issue operating performance changes of Malaysian IPOs differ systematically according to the level of DCA at the

[124] Roosenboom *et al.* (2003) split their DCA sample into three equal-sized groups (top tier, middle tier, and bottom tier) in preference to quartiles. Teoh *et al.* (1998a) find a monotonic pattern only when buy and hold returns of IPOs are adjusted by the NASDAQ Composite Index, while DuCharme *et al.* (2001) find this pattern only when CRSP value-weighted index was used.

time of IPOs. Table 12.8 and Table 12.9 report the median and mean changes in operating return on operating assets (OI/OA) and operating return on sales (OI/Sales) by DCA quartiles, respectively. Panel A and Panel B provide the analysis of changes from year 0 and changes from the prior year, respectively. Each panel reports the raw operating performance (top) and matched company-adjusted operating performance (bottom).

Focusing first on Panel A of Table 12.8, the median OI/OA significantly declines from year 0 to years +1, +2, and +3, and in all quartiles, except for the decline from year 0 to +1 for Q2, when the OI/OA of IPO companies is adjusted for the OI/OA of matched companies. The aggressive earnings management group (Q4) show more deterioration in *raw* OI/OA from year 0 to +1 and in *adjusted* OI/OA from year 0 to +1 and year 0 to +2. However, none of the declines in OI/OA between Q1 and Q4 groups is statistically significantly different.

The year-to-year analysis, as indicated in Panel B, shows that the greatest decline in OI/OA occurs immediately after the IPO (year 0 to +1). Even though all quartiles show significant declines in raw and matched company-adjusted OI/OA, IPO companies in the aggressive quartile (Q4) DCA are found to experience a greater deterioration (raw median = -5.60%; matched company-adjusted median = -6.87%). Nevertheless, the deterioration in OI/OA in each quartile is non-monotonic, not only from year 0 to +1 but in all post-IPO periods. In addition, the median performance deterioration between companies engaging in more aggressive earnings management (Q4) is not significantly different from the conservative earnings management group (Q1) for all post-IPO periods.

Table 12.8 The median and mean changes in operating return on operating assets (OI/OA) by DCA quartiles

Panel A:	Year 0 to +1					Year 0 to +2					Year 0 to +3				
Changes from year 0	All	Q1 Cons.	Q2	Q3	Q4 Aggr.	All	Q1 Cons.	Q2	Q3	Q4 Aggr.	All	Q1 Cons.	Q2	Q3	Q4 Aggr.
IPO company															
Median	-4.21[a]	-5.00[a]	-3.59[a]	-3.91[a]	-5.60[a]	-6.03[a]	-7.39[a]	-5.59[a]	-4.32[a]	-6.71[a]	-8.40[a]	-11.64[a]	-7.83[a]	-6.66[a]	-8.44[a]
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
z-stat for diff (Q4-Q1)				-0.22					0.54					0.97	
p-value (Q4-Q1)				0.824					0.586					0.334	
Mean	-5.58[a]	-6.62[a]	-4.14[a]	-4.23[a]	-7.38[a]	-8.14[a]	-10.86[a]	-7.18[a]	-6.52[a]	-8.04[a]	-13.61[a]	-20.86[a]	-9.37[a]	-9.30[a]	-15.05[a]
p-value	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000
t-stat for diff (Q4-Q1)				-0.431					1.08					0.796	
p-value (Q4-Q1)				0.667					0.281					0.428	
Matched company-adjusted															
Median	-3.44[a]	-4.20[a]	-0.25	-3.87[a]	-6.87[a]	-5.01[a]	-6.82[a]	-2.87[b]	-3.93[a]	-7.55[a]	-8.10[a]	-12.64[a]	-5.08[b]	-6.33[a]	-10.91[a]
p-value	0.000	0.000	0.155	0.002	0.000	0.000	0.005	0.048	0.008	0.000	0.000	0.000	0.021	0.002	0.000
z-stat for diff (Q4-Q1)				-0.32					-0.22					0.40	
p-value (Q4-Q1)				0.749					0.824					0.691	
Mean	-3.65[a]	-4.76[a]	-1.05	-0.58	-8.28[b]	-5.33[a]	-6.78[a]	-2.80[c]	-5.54[a]	-6.26	-11.97[a]	-19.54[a]	-5.23[b]	-6.79[a]	-16.52[a]
p-value	0.010	0.010	0.414	0.855	0.048	0.001	0.010	0.065	0.008	0.222	0.000	0.004	0.012	0.005	0.004
t-stat for diff (Q4-Q1)				-0.785					0.091					0.351	
p-value (Q4-Q1)				0.434					0.927					0.726	
Number of companies	254	63	64	64	63	254	63	64	64	63	254	63	64	64	63

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Table 12.8 (*continued*) The median and mean changes in operating return on operating assets (OI/OA) by DCA quartiles

Panel B:	Year 0 to +1					Year +1 to +2					Year +2 to +3				
Changes from prior year	All	Q1 Cons.	Q2	Q3	Q4 Aggr.	All	Q1 Cons.	Q2	Q3	Q4 Aggr.	All	Q1 Cons.	Q2	Q3	Q4 Aggr.
IPO company															
Median	-4.21[a]	-5.00[a]	-3.59[a]	-3.91[a]	-5.60[a]	-1.42[a]	-2.22[a]	-1.22[a]	-1.30[a]	-1.43[c]	-1.97[a]	-2.03[a]	-1.97[a]	-1.70[a]	-2.40[a]
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.060	0.000	0.000	0.008	0.002	0.001
z-stat for diff (Q4-Q1)				-0.22					1.54					-0.06	
p-value (Q4-Q1)				0.824					0.124					0.951	
Mean	-5.58[a]	-6.62[a]	-4.14[a]	-4.23[a]	-7.38[a]	-2.56[a]	-4.24[a]	-3.04[a]	-2.29[b]	-0.66	-5.47[a]	-10.00[c]	-2.19[b]	-2.78[a]	-7.01[b]
p-value	0.000	0.000	0.000	0.001	0.000	0.000	0.004	0.000	0.036	0.641	0.001	0.087	0.033	0.005	0.031
t-stat for diff (Q4-Q1)				-0.43					1.80[c]					0.45	
p-value (Q4-Q1)				0.667					0.075					0.651	
Matched company-adjusted															
Median	-3.44[a]	-4.20[a]	-0.25	-3.87[a]	-6.87[a]	-1.84[a]	-1.95	-1.73	-1.91[c]	-1.80	-1.81[a]	-3.12[a]	-2.16[b]	-1.01	-2.94[a]
p-value	0.000	0.000	0.159	0.002	0.000	0.006	0.135	0.178	0.072	0.437	0.000	0.004	0.027	0.351	0.008
z-stat for diff (Q4-Q1)				-0.32					0.53					0.43	
p-value (Q4-Q1)				0.749					0.593					0.666	
Mean	-3.65[a]	-4.76[a]	-1.05	-0.58	-8.28[b]	-1.69	-2.02	-1.75	-4.96	2.02	-6.64[a]	-12.76[b]	-2.43[c]	-1.25	-10.26[b]
p-value	0.010	0.010	0.414	0.855	0.048	0.210	0.366	0.169	0.154	0.535	0.001	0.042	0.081	0.515	0.041
t-stat for diff (Q4-Q1)				-0.79					1.03					0.32	
p-value (Q4-Q1)				0.434					0.306					0.751	
Number of companies	254	63	64	64	63	254	63	64	64	63	254	63	64	64	63

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05 and 0.10 levels, respectively, using a two-tailed test. The Wilcoxon signed-ranks test is used for the medians and the parametric *t*-test is used for means. The matched company-adjusted is calculated as IPO company's OI/OA minus the matched company's OI/OA. The difference in median and mean return between Q1 and Q4 is based on the Mann-Whitney U test and the independent *t*-test.

To demonstrate the robustness of the results, Table 12.9 reports an alternative operating performance measure, the operating return on sales (OI/Sales). The results confirm the earlier findings, in that the median OI/Sales deteriorates in each quartile from year 0 to years +1, +2, and +3. The more aggressive earnings management group is found to experience worse subsequent operating performance than the conservative earnings management group, either before or after adjusting for the OI/Sales of matched companies, except for the raw OI/Sales from year 0 to +3. However, only the deterioration in median performance from year 0 to +1 between Q1 and Q4 groups is weakly significant at the 10 percent level.

The analysis of changes from the prior year, as reported in Panel B of Table 12.9, also shows that the greatest decline in OI/Sales occurred in the year immediately after the IPOs (year 0 to +1). IPO companies in the aggressive DCA quartiles experience the greatest decline in performance (raw median = -5.11%; matched company-adjusted median = -4.44%) as compared to the IPO companies in the conservative DCA quartiles (raw median = -1.50%, matched company-adjusted median = -2.91%).

In general, the operating performance deteriorates in the post-IPO periods. There is evidence that aggressive earnings management IPOs tend to experience a greater deterioration in operating performance than the conservative earnings management groups. However, the differences in deterioration between the two groups in most periods are not statistically significant. The year-to-year analysis reveals that the greatest deterioration occurs in the year immediately after the IPO year. In addition, non-monotonic patterns are observed in the pattern of operating performance based on quartiles.

Table 12.9 The median and mean changes in operating return on sales (OI/Sales) by DCA quartiles

Panel A:	Year 0 to +1					Year 0 to +2					Year 0 to +3				
Changes from year 0	All	Q1 Cons.	Q2	Q3	Q4 Aggr.	All	Q1 Cons.	Q2	Q3	Q4 Aggr.	All	Q1 Cons.	Q2	Q3	Q4 Aggr.
IPO company															
Median	-3.05[a]	-1.50[a]	-3.17[a]	-2.66[a]	-5.11[a]	-4.62[a]	-4.88[a]	-3.86[a]	-3.89[a]	-6.07[a]	-7.54[a]	-8.08[a]	-7.56[a]	-6.07[a]	-7.71[a]
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
z-stat for diff (Q4-Q1)				-1.84[c]					-0.70					0.28	
p-value (Q4-Q1)				0.065					0.487					0.781	
Mean	-5.33[a]	-3.77[a]	-2.89[a]	-6.15[a]	-8.54[a]	-8.73[a]	-9.48[a]	-7.52[a]	-7.37[a]	-10.60[b]	-15.02[a]	-18.14[a]	-11.30[a]	-7.87	-22.96[a]
p-value	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.001	0.012	0.000	0.001	0.001	0.110	0.003
t-stat for diff (Q4-Q1)				-2.41[b]					-0.24					-0.53	
p-value (Q4-Q1)				0.018					0.809					0.595	
Matched company-adjusted															
Median	-2.90[a]	-2.91	-1.45	-2.49[c]	-4.44[a]	-3.05[a]	-2.79	-1.28	-2.66	-8.25[a]	-7.33[a]	-7.26[a]	-5.84[b]	-4.82[c]	-11.03[a]
p-value	0.000	0.103	0.554	0.090	0.001	0.003	0.177	0.659	0.215	0.007	0.000	0.009	0.027	0.055	0.000
z-stat for diff (Q4-Q1)				-1.67[c]					-1.26					-1.07	
p-value (Q4-Q1)				0.096					0.209					0.283	
Mean	2.15	-0.97	6.11	11.65	-8.42	2.38	7.39	4.16	9.37	-11.55	-4.35	-13.29[b]	12.06	9.27	-25.90[b]
p-value	0.587	0.791	0.291	0.342	0.249	0.577	0.382	0.348	0.407	0.184	0.455	0.048	0.377	0.480	0.027
t-stat for diff (Q4-Q1)				-0.92					-1.58					-0.96	
p-value (Q4-Q1)				0.360					0.118					0.341	
Number of companies	254	63	64	64	63	254	63	64	64	63	254	63	64	64	63

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Table 12.9 (*continued*) The median and mean changes in operating return on sales (OI/Sales) by DCA quartiles

Panel B:	Year 0 to +1					Year +1 to +2					Year +2 to +3				
Changes from prior year	All	Q1 Cons.	Q2	Q3	Q4 Aggr.	All	Q1 Cons.	Q2	Q3	Q4 Aggr.	All	Q1 Cons.	Q2	Q3	Q4 Aggr.
IPO company															
Median	-3.05[a]	-1.50[a]	-3.17[a]	-2.66[a]	-5.11[a]	-0.97[a]	-1.71[a]	-0.42[b]	-0.76	-1.64[b]	-1.65[a]	-2.04[a]	-1.71[b]	-1.70[b]	-1.34[b]
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.115	0.044	0.000	0.001	0.033	0.022	0.017
z-stat for diff (Q4-Q1)			-1.84[c]					0.86					0.18		
p-value (Q4-Q1)			0.065					0.392					0.855		
Mean	-5.33[a]	-3.77[a]	-2.89[a]	-6.15[a]	-8.54[a]	-3.40[a]	-5.71[a]	-4.63[a]	-1.21	-2.06	-6.29[a]	-8.66[c]	-3.77[b]	-0.50	-12.35[b]
p-value	0.000	0.000	0.002	0.003	0.000	0.003	0.004	0.002	0.459	0.560	0.003	0.061	0.013	0.914	0.020
t-stat for diff (Q4-Q1)			-2.41[b]					0.92					-0.53		
p-value (Q4-Q1)			0.018					0.358					0.596		
Matched company-adjusted															
Median	-2.90[a]	-2.91	-1.45	-2.49[c]	-4.44[a]	-1.12	-0.90	-1.14	-2.01	-0.75	-2.16[a]	-2.11[a]	-3.95[a]	-1.83	-1.55[b]
p-value	0.000	0.103	0.554	0.090	0.001	0.183	0.540	0.379	0.324	0.782	0.000	0.006	0.003	0.311	0.036
z-stat for diff (Q4-Q1)			-1.67[c]					0.21					0.41		
p-value (Q4-Q1)			0.096					0.832					0.684		
Mean	2.15	-0.97	6.11	11.65	-8.42	0.23	8.36	-1.95	-2.29	-3.13	-6.72	-20.67[b]	7.90	-0.09	-14.36[b]
p-value	0.587	0.791	0.291	0.342	0.250	0.952	0.331	0.707	0.830	0.550	0.159	0.027	0.553	0.990	0.030
t-stat for diff (Q4-Q1)			-0.92					-1.15					0.57		
p-value (Q4-Q1)			0.360					0.253					0.572		
Number of companies	254	63	64	64	63	254	63	64	64	63	254	63	64	64	63

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05 and 0.10 levels, respectively, using a two-tailed test. The Wilcoxon signed-ranks test is used for the medians and the parametric *t*-test is used for means. The matched company-adjusted is calculated as IPO company's OI/OA minus the matched company's OI/Sales. The difference in median and mean return between Q1 and Q4 is based on the Mann-Whitney U test and the independent *t*-test.

12.4 Summary

The present chapter provides an analysis of the earnings management practices of a sample of Malaysian IPOs. Analysis of current accruals shows that the level of earnings management is higher in the years when the IPO occurs and lower in subsequent years. Companies that were listed during the years of the East Asian crisis, 1997 and 1998, have higher levels of earnings management in these years compared to the other years in the sample period. In addition, further analysis that focuses on the companies that went public in 1997 and 1998 reveals that those companies that provide profit guarantees have higher levels of earnings management than non-profit guarantee companies. These findings suggest that Malaysian IPO companies employ income-increasing accounting accruals at the time of their IPOs to increase their offering proceeds. The evidence of higher earnings management during the East Asian crisis period suggests that companies were endeavouring to increase investors' confidence in their performance. In addition, companies also manage earnings to meet the voluntarily and non-voluntarily profit guarantee agreement. In sum, the results of the present study support the hypothesis that Malaysian IPO companies employ income-increasing strategies around offerings, and that this strategy was more prevalent during the East Asian crisis period, especially for those companies that provided a profit guarantee.

Analysis of the association between the magnitude of earnings management in the IPO year and post-IPO performance provides some evidence to support the view that aggressive earnings management at the time of an IPO leads to poor stock market and operating performance, post-IPO. While operating performance deteriorates for the one-, two-, and three-year periods, the year-to-year analysis indicates that the greatest deterioration occurs in the year immediately after the IPOs. Furthermore, the

deterioration is non-monotonic in each quartile; the difference in the stock market and operating performance between companies engaging in aggressive and conservative earnings management is only significantly different for some of the periods examined.

Overall, the results of the present study reveal that Malaysian IPO companies opportunistically manage earnings at the time of IPOs. However, the market fails to realise that the earnings management symbolises a transitory increase in earnings. Consistent with the arguments of Teoh *et al.* (1998a) and Rangan (1998), the negative association between the aggressive earnings management group and the three-year median holding period returns groups indicates that the market is disappointed and adjusts its valuation downwards in the post-IPO periods. In sum, the results provide a degree of support for the earnings management hypothesis.

The following chapter provides the overall summary and conclusion of the thesis.

Chapter 13

Overall summary and conclusions

13.1 Introduction

This last chapter contains an overall summary of the thesis and its conclusions. The chapter is organised as follows: Section 13.2 presents a general overview of the study; Section 13.3 provides a summary of the main results from the three empirical studies; Section 13.4 discusses the implications of the studies; Section 13.5 describes the limitations of the study; Section 13.6 offers some suggestions for future research; and finally, Section 13.7 summarises and concludes the research.

13.2 Overall view of the study

The principal aim of this thesis is to investigate the performance of Malaysian initial public offerings (IPOs) and the possible influence of earnings management. Even though similar studies have been undertaken in many developed markets, the evidence from less developed markets, such as Malaysia, is sparse. Previous Malaysian studies (e.g., Wu, 1993; Mohamad *et al.*, 1994; Paudyal *et al.*, 1998, Jelic *et al.*, 2001; Corhay *et al.*, 2002) exhibit weaknesses in terms of the sample period employed, the sampling procedure, the abnormal returns models used, and their limited scope. The thesis provides the first thorough study of IPOs incorporating both long run stock market and operating performance. It also investigates the earnings management explanation for the performance observed on the Malaysian market, which has a different legal, institutional and cultural setting to that of more developed markets.

An IPO takes place when a security is sold to the general public for the first time in order to obtain a listing on a stock exchange, and is a significant source of finance for Malaysian companies. A total of RM49.9 billion was raised through IPOs over the period from 1973 to 2004. In addition, companies making equity IPOs in Malaysia are required by law to reserve 30% of the shares allocated to the public for Bumiputera (local indigenous people) applicants in order to comply with government policy.

The economic crisis suffered by Malaysia in 1997 and 1998 profoundly affected the IPO market and increased the need to gain investors' confidence about IPO companies' performance. Interestingly, at the same time, certain companies were affected by the requirement to provide a guarantee that they would achieve 90% of the profits forecast in the prospectus and 90% of the forecast profits for the two years following the official listing. The significance of the IPOs as a means of raising capital, the existence of unfavourable economic conditions, and the unique requirement of IPO profit guarantees, makes the study of the performance of Malaysian IPOs, and the earnings management activity of these companies of great interest. This study contributes to the existing knowledge of the performance of Malaysian IPOs and earnings management.

To address IPO performance, this thesis applied two alternative research methods: (i) market-based; and (ii) accounting-based. Share price data was drawn on to investigate the stock market performance of 454 Malaysian IPOs. The sample comprised 91% of the potential number of IPOs available and covered 83.6% of newly-listed companies during the period 1990 to 2000. Of the 454 IPOs, 435 were private and 19 were privatisation. Accounting data was also employed to investigate the operating performance of 254 IPOs which had a full five years of data. Although just half of the potential numbers of Malaysian IPO companies remained in the sample, the large

sample size suggests that it is likely to be representative. The only previous study investigating the operating performance of Malaysian IPOs, by Sun and Tong (2002), used a sample of just 24 privatisation IPOs. The present study comprises 239 private IPOs and 15 privatisation IPOs. In addition to the alternative performance investigations, the earnings management activity of Malaysian IPOs is analysed as a potential explanation for the post-IPO performance. The same sample as used in the operating performance study is utilised.

Since the early 1990s, research on countries such as the US (e.g., Ritter, 1991; Loughran and Ritter, 1995; Gompers and Lerner, 2003) and the UK (e.g., Levis, 1993; Khurshed *et al.*, 1999; Espenlaub *et al.*, 2000) has found that IPO companies underperform their benchmarks in the long run. However, this evidence on long run post-IPO stock market performance is controversial, with different researchers reporting contrasting results depending on the method used to measure returns. In addition, several critiques have been put forward regarding the appropriateness of the expected and abnormal returns models, together with the appropriateness of different techniques for testing for statistical significance. A number of empirical studies propose several explanations for long run return underperformance, including measurement problems (Ritter, 1991; Loughran and Ritter, 1995; Fama, 1998) and earnings management (Teoh *et al.*, 1998a; Roosenboom *et al.*, 2003; DuCharme *et al.*, 2004). According to the measurement problem explanation, underperformance appears to occur either because researchers fail to control properly for risk, or as a result of problems related to the measurement of returns over long horizons, or the wrong choice of benchmark (Fama, 1998). Meanwhile the earnings management explanation suggests that managers manage their earnings upwards through income-increasing accruals at the time of IPOs in order to increase offering proceeds. Investors misinterpret the increases in earnings

and fail to realise their transitory nature. Due to the reversal of accruals in the aftermarket, earnings do not persist. Consequently, investors are disappointed and adjust their valuation downwards, which leads to post-IPO underperformance.

13.3 Summary of the main results

This thesis has presented three empirical studies concerning the performance of Malaysian IPOs and earnings management; the results of each are summarised in this section.

13.3.1 Market-based performance results

The results of the initial returns are in agreement with existing international evidence and are also consistent with the results observed in Malaysia. However, the findings concerning long run returns are contrary to the results discovered in developed markets. This study finds a significant *over*performance when the event-time cumulative abnormal returns and buy-and-hold abnormal returns are used, except when the equally-weighted weighting scheme is applied to matched companies' benchmarks. The significant *over*performance disappears when the Fama-French (1993) three-factor regressions are used. This is in line with the argument of Gompers and Lerner (2003), that the relative performance of an IPO sample depends on the method used to examine performance. As argued by Ritter and Welch (2002), and Ritter (2003), the sample used in terms of the time period and selection criteria also contributes to the different findings across studies on the long run performance of IPOs. The results reported in the first study, using the event-time approach, suggest that investors who invest in IPO

companies will obtain positive returns in the long run but do not gain any abnormal returns when calendar-time analysis is employed.

This study reveals that, contrary to the results observed by Loughran and Ritter (1995), when the sample is segmented by the year of listing and the long run performance is compared with size-matched companies, the underperformance is not concentrated in certain listing years that have large numbers of IPO companies. The long run performance does not significantly differ across sectors. Moreover, there is no significant difference in performance between IPO companies listed on the Main Board and the Second Board of the KLSE. Private IPOs produce insignificant underperformance while privatisation IPOs produce insignificant *over*performance over the three-year post-listing period. The low initial returns group is shown to have the worst aftermarket performance compared to their matching companies, while the small gross proceeds group is reported to have a significant *over*performance over the three-year horizon. Finally, an investment in large IPO companies suffers greater negative returns compared to a portfolio of matched companies of a similar size.

In sum, the results of the first empirical study show that the IPO companies perform inconsistently in the long run when different benchmarks and weighting schemes are used. In particular, both the event-time and calendar-time approaches produce different results. These findings are consistent with the measurement problem explanation, namely that the long run stock market performance depends on the method used to calculate the returns.

13.3.2 Accounting-based performance results

A comparison of the pre- and post-IPO accounting-based operating performances provides strong evidence of declining performance in the IPO year and up to three years following the IPO, using both accrual- and cash flow-based approaches. It is more severe when the performance is measured using accrual-based approaches. This finding is consistent with the existing international evidence documenting the long run underperformance of IPOs. The difference in the results between accrual-based and cash flow-based measures suggests the possibility of earnings manipulation by IPO managers who report increased earnings at the time of the IPOs.

Assessments of the potential sources of operating performance changes show that IPO companies have higher growth in sales and capital expenditure than matched companies. This indicates that the deterioration in operating performance does not appear to be caused by a reduction in sales or cutbacks in capital expenditure. However, the reduced efficiency in asset usage does have an impact on operating performance. Additional analyses based on different market expectation indicators consistently reveal a decline in post-IPO operating performance. These show that investors have a high expectation of future earnings growth based on the performance observed prior to the IPOs. However, this expectation was not fulfilled. Malaysian IPO companies are also found to reduce their borrowings at the time of an IPO, and also in the first and second years after IPOs, but these increase afterwards.

Univariate analysis of IPOs involving family relationships shows slightly greater post-IPO deterioration in performance than IPOs with no family involvement. However, there is little evidence of family involvement significantly affecting post-IPO

performance. There is also no real pattern to the deterioration in performance between high and low ownership groups. Therefore, this study does not support the signalling theory of ownership of Leland and Pyle (1977) and Downes and Heinkel (1982). Univariate analysis of IPOs having high and low underpricing found that there is a tendency for the high underpricing group to show inferior accrual-based operating performance in the long run. Conversely, there is a reverse pattern in the cash flow-based performance measure, indicating support for the signalling model of underpricing.

Overall, the results of this study show that operating performance (cash flow- and accrual-based), asset turnover and market expectations decline after IPOs. While sales gradually increase, capital expenditure increases but then slightly declines; the leverage ratio decreases and then increases slowly after IPOs. Univariate analysis of the association between family relationships, retained ownership and post-IPO operating performance produces little evidence to explain the deterioration in operating performance. However, underpricing partially explains the deterioration when the cash flow-based performance measure is used.

13.3.3 Earnings management results

The earnings management analysis based on discretionary current accruals (DCA) shows that the level of earnings management is higher in the years when the IPOs occur and in the year immediately following the IPOs. This indicates that there is evidence that Malaysian IPO companies manage their earnings upwards at the time of going public, and maintain their earnings for the fiscal year immediately after the IPOs. The continuance of earnings management in the post-IPO year may reflect the managers'

need to ensure that actual earnings are close to those forecast in the IPO prospectus as well as in the two years of maintainable earnings following the IPOs. Overall, the evidence suggests that the managers of Malaysian IPO companies opportunistically advance accruals in an attempt to improve earnings during the IPO year. However, the high level of earnings management in the IPO year is not sustained in the post-IPO years. Thus, the evidence provides a possible explanation for the observed decline in operating performance.

There is also evidence that earnings management was higher during the East Asian crisis years from 1997 to 1998. The level of earnings management in these years is significantly different from that recorded for several of the sample years examined. It appears that companies managed their earnings during these years, not merely due to the economic crisis to attract investors and improve confidence in their companies' performance, but also due to the requirement to meet their first and second year of guaranteed profits.

Analysis of the association between the magnitude of earnings management in the IPO year and post-IPO performance provides some evidence that aggressive earnings management at the time of an IPO leads to poor long run stock market and operating performance. While operating performance deteriorates for the one-, two-, and three-year periods, the year-to-year analysis indicates that the greatest deterioration occurs in the year immediately after the IPOs. Furthermore, the deterioration is non-monotonic in each quartile; the difference in the stock market and operating performance between companies engaging in aggressive and conservative earnings management is only significantly different for some of the periods examined.

In general, the results of the third study reveal that Malaysian IPO companies appear to opportunistically manage earnings at the time of IPOs. However, the market fails to realise that the earnings management symbolises a transitory increase in earnings. In line with the arguments of Teoh *et al.* (1998a) and Rangan (1998), the negative association between the aggressive earnings management group and the three-year median holding period returns groups indicates that the market is disappointed and adjusts its valuation downwards in the post-IPO periods. In sum, the results provide a degree of support for the earnings management hypothesis.

In conclusion, the results summarised in this section suggest that the long run stock market performance is variable and its assessment depends on the method used to measure returns. The results concerning post-IPO operating performance suggest that the accrual-based performance measure shows more deterioration in earnings, which may contribute to post-IPO underperformance. The earnings management results indicate the existence of earnings management at the time of an IPO, especially during an economic crisis period, and for companies that provide voluntary and non-voluntary profit guarantees in their IPO prospectuses.

13.4 Implications of the study

Several general implications of this thesis can be drawn for investors, security analysts, companies and accounting standard setters. Given the conflicting results of poor post-IPO stock market performance, investors may do better holding Malaysian IPO shares for a short period with a likelihood of achieving a high gain. In addition, the results of univariate analyses help investors to identify which characteristics are associated with more underperformance or *over*performance, which is informative to

them when formulating their investment strategies. For security analysts, the conflicting results afford more opportunities for them to extend their consultation services and expertise to investors by recommending stocks that might *over*perform in the long run. The decline in operating performance has implications for the IPO issuers. They need to assure investors that their stocks are worthwhile investments in the long run. The implication of the earnings management results is that investors should be cautious about investing in IPOs to avoid losses. It would be advisable for them to invest in companies with a low level of current accruals at the time of IPOs especially when economic conditions are unfavourable. IPO companies may want to consider how reasonable accounting choices can lower their cost of equity capital. Moreover, the findings are useful for Malaysian accounting standard setters, who may draw on the earnings management results to evaluate how much discretion should be allowed for company managers to adjust reported accounting figures. This is to ensure that managers do not use their private information to deceive the market or to gain private benefits at the expense of investors.

13.5 Limitations of the study

The results and implication of this study should be considered in the context of the following limitations. First, the post-IPO period scrutinised in this study spanned three years and this may be an inadequate length of time for gains/losses to be revealed by the IPO companies. In addition, the pre-IPO period analysed is only one year for operating performance due to the difficulty of getting pre-IPO data. However, as explained in Chapters 5 and 8, extending the post-IPO period beyond three years was not feasible due to data availability and sample size problems. Furthermore, the three-year period is consistent with prior research on stock market performance (e.g., Ritter, 1991; Levis,

1993; Lee *et al.*, 1996a,b; Ljungqvist, 1997; Khurshed *et al.*, 1999; Durukan, 2002) and operating performance (e.g., Jain and Kini, 1995, Pagano *et al.*, 1998; Chan *et al.*, 2003; Khurshed *et al.*, 2003; Kim *et al.*, 2004).

Second, this study calculates the long run stock market performance from the end of the first day of trading. Some studies (e.g., Goergen, 1998; Khurshed *et al.*, 1999) have argued that price support (stabilisation) in the first few trading days may introduce a downward bias in long run returns; they suggest measuring returns after the first month of trading. In contrast to the US and the UK, stabilisation does not appear to be subject to regulation in Malaysia. However, stabilisation is only relevant when share issues are *over*priced, which occurs in only a small proportion (6%) of the sample of 454 Malaysian IPOs. Thus, the overall impact on reported results is likely to be very small. Further, the potential downward bias from using the first day price would merely serve to dampen the generally observed long run *over*performance of Malaysian IPOs.

Third, this study does not differentiate between private IPOs and PIPOs when analysing operating performance and earnings management since the number of PIPOs in the sample is small (15 companies out of 254). However, this is unlikely to affect the results. In addition, the results based on the stock market performance analysis indicate that there is no significant difference in performance between private IPOs and PIPOs.

Fourth, the findings on earnings management are subject to a caveat because of the difficulty in measuring earnings management. The 'correct' estimation approach employed to detect earnings management remains an open empirical question that is largely beyond the scope of this thesis. Furthermore, because of data limitations, this study used only discretionary current accruals to proxy for earnings management. As

demonstrated by Dechow *et al.* (1995), all the earnings management models have weaknesses, and by omitting long term accruals, it presumably weakens the power of the earnings management model even further. However, even when using a model with limited power, earnings management is still observed in this study.

Finally, this study examines the association between company or IPO characteristics and post-IPO performance using univariate analysis instead of performing a regression analysis. This is due to the fact that an examination of the determinants of the stock market and operating performance is not the focus of this study. The scope of this thesis encompasses an examination of long run stock market and operating performance, the cross-sectional patterns in performance and the earnings management around the IPOs. The determinants of the post-IPO performance using the regression approach are left for future research.

13.6 Suggestions for future research

The examination of long run stock market and operating performance, together with earnings management, is a fruitful area of research, not only for IPO events but also for other corporate events such as SEOs, mergers and acquisitions, and management buyouts, among others. A further extension of this study might be to examine the long run stock market and operating performance of companies making SEOs and incorporate the earnings management issues around the SEOs; to date, there are no studies examining these issues for SEO companies in Malaysia. In addition, it would be interesting to see whether the conflicting results on the long run returns of Malaysian IPOs are also observed for Malaysian SEOs. It is also expected that the operating

performance will decline following Malaysia SEOs and companies engaging in earnings management at the time of issuing additional equity.

It is suggested that future research employs the regression analysis approach to investigate the determinants of performance. In this way, the extent of the relationship between explanatory variables and performance can be assessed. The precise causes of long run underperformance remain an issue that is worthy of further investigation. Other potential factors such as the degree of multi-nationality of IPO companies, their level of product diversification, and their ownership structure might explain the long run stock market, operating performance and earnings management, and are avenues for future research (e.g., Goergen, 1998; Khurshed *et al.*, 1999). A further innovative direction for future research would be to study MESDAQ Market listed companies to analyse the relationship between venture capital financing prior to IPOs and their relationship with long run performance. Future research may also test alternative earnings management measures such as specific accruals. It would also be worthwhile to investigate in greater detail whether IPO companies manage earnings to meet their earnings forecast threshold by looking at an individual company's forecasts to identify whether there is any deviation of 10% or more between the reported earnings in the audited accounts following the IPO and any forecasts previously made in the prospectus.

13.7 Summary and conclusions

An overall summary of the thesis is provided in this chapter. In general, the results support the existing debate on the long run returns anomaly, suggesting that long run stock market performance depends on the methods used to measure returns. The results

based on accounting-based operating performance show that operating performance declines in the post-IPO period using both accrual- and cash flow-based measures of operating performance. The higher decline perceived in the accrual-based measure suggests the existence of earnings management at the time IPOs occur and partial reversals in accrual following IPOs. Inconsistent results observed between stock market and operating performance strongly support the likelihood that the analysis of long run stock market performance is driven by measurement errors. Moreover, there is some evidence that Malaysian IPO companies manage their earnings at the time of IPOs, which is more prevalent during unfavourable economic conditions and among those companies that provided profit guarantees in their IPO prospectuses. In summary, this thesis supports the measurement problems and earnings management explanations of long run IPO performance.

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Table 9.1A The median and mean level of operating return on total assets (OI/TA) and operating cash flow return on total assets (OCF/TA)

Fiscal year relative to IPO	Median level (%)				Mean level (%)				% Positive	*z*-statistic	n
	IPO company	Matched company	*Difference:* *z*-statistic (p-value)		IPO company	Matched company	*Difference:* *t*-statistic (p-value)				
Panel A: OI/TA											
-1	12.60	8.82	-7.44[a]	(0.000)	15.50	9.58	4.98[a]	(0.000)	72.05	7.028[a]	254
0	11.97	6.71	-7.67[a]	(0.000)	12.12	6.96	5.56[a]	(0.000)	72.05	7.028[a]	254
+1	7.83	5.89	-1.98[b]	(0.048)	7.74	5.49	2.15[b]	(0.033)	55.91	1.882[c]	254
+2	6.51	5.30	-0.15	(0.880)	5.50	4.60	0.80	(0.427)	48.03	-0.627	254
+3	4.41	5.51	-3.38[a]	(0.001)	0.57	5.47	-2.74[a]	(0.007)	40.94	-2.886[a]	254
Panel B: OCF/TA											
-1	9.59	9.69	-1.30	(0.192)	11.22	9.59	1.45	(0.148)	53.94	1.255	254
0	8.04	8.34	-1.27	(0.204)	8.26	8.49	-0.22	(0.827)	46.46	-1.129	254
+1	8.22	9.44	-1.12	(0.262)	9.00	9.40	-0.35	(0.724)	48.43	-0.502	254
+2	9.27	7.97	0.07	(0.943)	8.19	8.18	0.01	(0.988)	48.82	-0.376	254
+3	7.78	8.32	-1.74[c]	(0.082)	7.18	8.31	-1.12	(0.263)	44.09	-1.882[c]	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

Appendices

Table 9.2A The median and mean changes in operating return on total assets (OI/TA)

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre-post-IPO changes (%)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	-1.27[a]	-3.38[a]	-5.31[a]	-7.76[a]	-7.06[a]	-10.01[a]	-9.-04[a]	-14.94[a]
p-value	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000
Matched company	-0.72[a]	-2.62[a]	-2.52[a]	-4.08[a]	-2.87[a]	-4.98[a]	-3.38[a]	-4.11[a]
p-value	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000
Matched company-adjusted	-0.42	-0.76	-3.36[a]	-3.67[b]	-5.19[a]	-5.03[a]	-6.31[a]	-10.83[a]
p-value	0.153	0.570	0.000	0.015	0.000	0.001	0.000	0.000
Panel B:								
Year-to-year changes (%)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	-1.27[a]	-3.38[a]	-3.22[a]	-4.38[a]	-1.21[a]	-2.25[a]	-1.85[a]	-4.93[a]
p-value	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.002
Matched company	-0.72[a]	-2.62[a]	-0.63[a]	-1.47	-0.55[a]	-0.89	0.01	0.87
p-value	0.000	0.003	0.001	0.182	0.012	0.421	0.895	0.363
Matched company-adjusted	-0.42	-0.76	-2.99[a]	-2.91[a]	-1.18[b]	-1.35	-1.50[a]	-5.80[a]
p-value	0.153	0.570	0.000	0.012	0.013	0.247	0.000	0.002
Number of companies	254	254	254	254	254	254	254	254

Note:

[a, and b] Significantly different from zero at the 0.01 and 0.05 levels, respectively, using a two-tailed test.

Table 9.3A The median and mean changes in operating cash flow return on total assets (OCF/TA)

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre-post-IPO changes (%)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	-3.67[a]	-2.96[a]	-2.44[a]	-2.22[c]	-2.21[a]	-3.03[a]	-2.60[a]	-4.04[a]
p-value	0.000	0.010	0.002	0.055	0.001	0.004	0.000	0.000
Matched company	-0.56	-1.09	0.25	-0.18	-1.45[b]	-1.41[c]	-1.24[c]	-1.27
p-value	0.240	0.237	0.797	0.829	0.048	0.094	0.071	0.186
Matched company-adjusted	-4.31[b]	-1.87	-3.67[b]	-2.04	-3.20	-1.62	-1.73[b]	-2.77[c]
p-value	0.011	0.210	0.019	0.169	0.109	0.231	0.039	0.059
Panel B:								
Year-to-year changes (%)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	-3.67[a]	-2.96[a]	-0.22	0.74	-0.26	-0.81	-0.65	-1.01
p-value	0.000	0.010	0.579	0.514	0.721	0.410	0.147	0.248
Matched company	-0.56	-1.09	0.50	0.91	-0.58[c]	-1.22[c]	-0.04	0.13
p-value	0.240	0.237	0.340	0.303	0.056	0.097	0.761	0.862
Matched company-adjusted	-4.31[b]	-1.87	-1.66	-0.17	0.82	0.41	-1.46	-1.14
p-value	0.011	0.210	0.513	0.912	0.298	0.741	0.138	0.323
Number of companies	254	254	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

Table 9.4A The median and mean changes in market-to-book equity

	Median	Mean	Median	Mean	Median	Mean
Panel A:						
Pre-post-IPO changes (ratio)	***Year 0 to +1***		***Year 0 to +2***		***Year 0 to +3***	
IPO company	-0.14[a]	-0.33[b]	-0.30[a]	-0.21	-0.68[a]	-0.79[c]
p-value	0.008	0.036	0.006	0.302	0.000	0.080
Matched company	-0.11[b]	0.61	-0.31[a]	0.58	-0.38[a]	-1.67
p-value	0.029	0.353	0.000	0.393	0.000	0.231
Matched company-adjusted	-0.15	-0.94	-0.16	-0.79	-0.25[b]	0.88
p-value	0.101	0.173	0.454	0.267	0.048	0.546
Panel B:						
Year-to-year changes (ratio)	***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	-0.14[a]	-0.33[b]	0.02	0.12	-0.12[b]	-0.57
p-value	0.008	0.036	0.348	0.501	0.031	0.196
Matched company	-0.11[b]	0.61	-0.08	-0.03	-0.10[b]	-2.25[c]
p-value	0.029	0.353	0.104	0.877	0.019	0.071
Matched company-adjusted	-0.15	-0.94	0.09	0.15	-0.13	1.68
p-value	0.101	0.173	0.191	0.565	0.212	0.204
Number of companies	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

Table 9.5A The median and mean changes in total debt to equity

	Median	Mean	Median	Mean	Median	Mean	Median	Mean
Panel A:								
Pre-post-IPO changes (%)	***Year -1 to 0***		***Year -1 to +1***		***Year -1 to +2***		***Year -1 to +3***	
IPO company	-11.72[a]	-29.83[a]	-4.79[a]	-10.50	-0.05	8.78	0.46	-9.62
p-value	0.000	0.000	0.002	0.278	0.814	0.376	0.119	0.834
Matched company	0.96[a]	-6.58	1.21[b]	8.54	0.48[a]	0.40	2.76[a]	-171.28
p-value	0.000	0.574	0.012	0.241	0.005	0.983	0.003	0.367
Matched company-adjusted	-16.97[a]	-23.25	-8.91[a]	-19.05	-3.53	8.37	-0.92	161.65
p-value	0.000	0.108	0.001	0.111	0.345	0.693	0.834	0.407
Panel B:								
Year-to-year changes (%)	***Year -1 to 0***		***Year 0 to +1***		***Year +1 to +2***		***Year +2 to +3***	
IPO company	-11.72[a]	-29.83[a]	1.66[a]	19.32[a]	2.52[a]	19.28[a]	0.53[a]	-18.40
p-value	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.716
Matched company	0.96[a]	-6.58	0.00	15.13	0.00	-8.14	0.00	-171.68
p-value	0.000	0.574	0.264	0.211	0.173	0.700	0.529	0.316
Matched company-adjusted	-16.97[a]	-23.25	3.14[a]	4.20	3.25[a]	27.42	1.67[c]	153.28
p-value	0.000	0.108	0.005	0.747	0.018	0.209	0.051	0.391
Number of companies	254	254	254	254	254	254	254	254

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

Table 9.6A Operating performance of IPOs based on retained ownership quartiles

Operating performance	Family group	IPO company				Matched company-adjusted			
		-1 to 0	-1 to +1	-1 to +2	-1 to +3	-1 to 0	-1 to +1	-1 to +2	-1 to +3
OI/OA	'Low' ownership (Q1)	-0.97	-4.14	-6.07	-9.01	-0.33	-3.38	-5.03	-8.83
	'High' ownership (Q4)	-1.44	-7.14	-7.58	-10.26	0.57	-4.36	-6.94	-9.58
	z-statistic for difference (Q4-Q1)	-1.03	-1.61	-1.22	-1.28	0.49	-0.12	-0.77	-0.30
	p-value	0.302	0.107	0.223	0.202	0.624	0.905	0.442	0.764
OI/Sales	'Low' ownership (Q1)	0.99	-1.36	-2.64	-4.80	1.87	-2.82	-2.20	-4.78
	'High' ownership (Q4)	-0.48	-4.39	-6.26	-7.39	0.72	-1.57	-2.77	-5.32
	z-statistic for difference (Q4-Q1)	-2.71[a]	-2.43[b]	-2.17[b]	-2.15[b]	-0.20	0.15	-0.58	-0.44
	p-value	0.007	0.015	0.030	0.031	0.843	0.878	0.563	0.662
OCF/OA	'Low' ownership (Q1)	-1.14	-3.69	-3.55	-0.02	-1.69	-6.06	-4.26	0.05
	'High' ownership (Q4)	-0.94	-0.67	-1.12	-2.37	-3.83	1.30	-4.66	-2.79
	z-statistic for difference (Q4-Q1)	0.04	1.48	0.68	-0.10	-0.23	1.99[b]	-0.66	-0.18
	p-value	0.971	0.139	0.499	0.924	0.817	0.047	0.509	0.855
OCF/Sales	'Low' ownership (Q1)	0.26	-2.00	-0.96	-0.80	-0.73	-1.26	-3.57	-2.40
	'High' ownership (Q4)	-1.66	1.39	0.73	-2.00	-1.55	3.07	1.09	-4.39
	z-statistic for difference (Q4-Q1)	-0.62	1.81[c]	0.85	-0.24	-0.82	1.38	0.98	-0.03
	p-value	0.537	0.070	0.395	0.809	0.414	0.167	0.326	0.979
Number of companies		126	126	126	126	126	126	126	126

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05, and 0.10 levels, respectively, using a two-tailed test.

Table 9.7A Multivariate analysis of family relationships, retained ownership, underpricing and post-IPO operating performance

	$Perf_{-1to0}$	$Perf_{-1to+1}$	$Perf_{-1to+2}$	$Perf_{-1to+3}$	$PerfAj_{-1to0}$	$PerfAj_{-1to+1}$	$PerfAj_{-1to+2}$	$PerfAj_{-1to+3}$
Panel A: OI/OA								
Intercept	5.231 (0.75)	4.220 (0.51)	1.310 (0.15)	16.353 (1.29)	-3.832 (-0.44)	-7.997 (-0.82)	1.807 (0.18)	12.628 (0.94)
FAMILYR	-0.750 (-0.32)	-1.050 (-0.41)	-0.701 (-0.27)	-3.723 (-0.97)	-1.426 (-0.45)	-5.928 (-1.42)	-0.856 (-0.27)	-1.851 (-0.44)
REOWNER	-0.113 (-1.07)	-0.155 (-1.28)	-0.144 (-1.15)	-0.389 (-2.15)[b]	0.063 (0.45)	0.116 (0.73)	-0.100 (-0.69)	-0.313 (-1.64)
IR	0.010 (0.91)	-0.002 (-0.14)	-0.009 (-0.67)	-0.008 (-0.37)	-0.002 (-0.11)	-0.008 (-0.50)	0.003 (0.18)	0.006 (0.24)
Adjusted R^2	-0.007	-0.005	-0.005	0.006	-0.011	0.001	-0.010	-0.004
Panel B: OI/Sales								
Intercept	4.423 (1.50)	8.143 (1.63)	12.091 (1.82)[c]	27.668 (1.98)[b]	3.420 (0.16)	-14.748 (-0.88)	30.952 (1.13)	32.845 (1.40)
FAMILYR	-0.810 (-0.95)	-0.908 (-0.51)	-0.322 (-0.11)	-10.042 (-1.88)[c]	-6.106 (-1.07)	-19.413 (-2.10)[b]	-5.092 (-0.69)	-0.372 (-0.04)
REOWNER	-0.044 (-1.11)	-0.130 (-1.87)[c]	-0.182 (-2.14)[b]	-0.393 (-1.99)[b]	0.015 (0.05)	0.420 (1.46)	-0.347 (-0.83)	-0.566 (-1.62)
IR	0.001 (0.31)	-0.022 (-1.80)[c]	-0.060 (-3.28)[a]	-0.053 (-1.80)[c]	-0.012 (-0.43)	-0.030 (-1.56)	0.008 (0.16)	0.068 (0.76)
Adjusted R^2	-0.002	0.026	0.065	0.030	-0.010	0.026	-0.006	-0.002

continued on next page

Table 9.7A (*continued*) **Multivariate analysis of family relationships, retained ownership, underpricing and post-IPO operating performance**

	$Perf._{-1to0}$	$Perf._{-1to+1}$	$Perf._{-1to+2}$	$Perf._{-1to+3}$	$PerfAj._{-1to0}$	$PerfAj._{-1to+1}$	$PerfAj._{-1to+2}$	$PerfAj._{-1to+3}$
Panel C: OCF/OA								
Intercept	-2.685	-12.888	-9.776	-3.824	-6.922	-15.086	-15.111	-1.617
	(-0.25)	(-1.18)	(-1.03)	(-0.36)	(-0.47)	(-0.99)	(-1.06)	(-0.11)
FAMILYR	1.905	-2.163	0.339	2.446	1.410	-1.525	2.660	5.159
	(0.55)	(-0.66)	(0.11)	(0.79)	(0.34)	(-0.36)	(0.69)	(1.25)
REOWNER	-0.019	0.154	0.046	-0.064	0.046	0.170	0.124	-0.087
	(-0.14)	(1.11)	(0.37)	(-0.47)	(0.24)	(0.89)	(0.68)	(-0.45)
IR	-0.001	-0.003	0.022	0.022	0.009	0.011	0.020	0.016
	(-0.09)	(-0.20)	(1.72)[c]	(1.87)[c]	(0.46)	(0.62)	(1.15)	(1.06)
Adjusted R^2	-0.011	-0.006	-0.002	0.000	-0.010	-0.007	-0.002	-0.001
Panel D: OCF/Sales								
Intercept	-6.054	-17.809	3.850	-4.844	-18.011	-14.106	-13.847	12.859
t-statistic	(-0.45)	(-1.58)	(0.36)	(-0.24)	(-0.61)	(-0.59)	(-0.56)	(0.25)
FAMILYR	-1.862	-5.890	-2.781	-10.051	-4.525	-8.213	1.665	-7.663
t-statistic	(-0.39)	(-1.36)	(-0.48)	(-0.81)	(-0.60)	(-1.27)	(0.22)	(-0.48)
REOWNER	0.076	0.311	-0.057	0.177	0.294	0.282	0.179	-0.054
t-statistic	(0.40)	(1.94)[c]	(-0.33)	(0.46)	(0.78)	(0.95)	(0.55)	(-0.08)
IR	0.012	-0.001	0.027	0.014	0.017	0.003	0.039	0.016
t-statistic	(0.48)	(-0.07)	(1.54)	(0.82)	(0.51)	(0.10)	(1.01)	(0.35)
Adjusted R^2	-0.009	0.007	-0.006	-0.006	-0.008	-0.002	-0.006	-0.011
Number of companies	246	246	246	246	246	246	246	246

Note:

[a, b, and c] Significantly different from zero at the 0.01, 0.05 and 0.10 levels, using a two-tailed test.

The *t*-statistics given in brackets were adjusted for heteroscedasticity (White's correction).

$Perf._{-1to0}$ and $PerfAj._{-1to0}$ refer to performance change from year -1 to year 0 before and after adjusting for the matching companies respectively, and so forth.

FAMILYR, REOWNER and IR refer to family relationships, retained ownership and underpricing, respectively.